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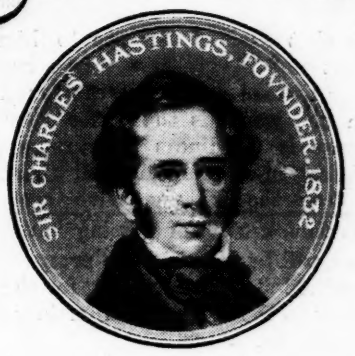

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Observations
ON
OSTEO-ARTHRITIS OF THE HIP.*

BY
GEORGE PARKER, M.A., M.D.,
HONORARY CONSULTING PHYSICIAN TO THE GENERAL HOSPITAL, BRISTOL.

OSTEO-ARTHRITIS of the hip, though common, is so often overlooked or mistaken for sciatica or subacute rheumatism that it seems worth while considering its symptoms in detail, especially since its progress and successful treatment largely depend on its early recognition. I ask attention first to a tabular classification of joint diseases, so that I may make quite clear what type of disorder it really is. The confusion of names in chronic joint diseases is so great that even a tentative classification may be of use.

GROUP A.
- Traumatic arthritis.
- Haemophilic arthritis.
- Tabetic and syringo-myelic arthritis.
- True gout.
- Heberden's nodes.
- Acromegalic joints.
- Pulmonary osteo-arthritis.
- Spondylitis, Type A.
- Osteo-arthritis multiplex.
- Osteo-arthritis of the hip.

GROUP B1.
- Purulent arthritis—for example, streptococcal or pneumococcal joints.
- Arthritis due to typhoid and other fevers, to dysentery, diphtheria, etc.
- Syphilitic arthritis.
- Tuberculous arthritis.

GROUP B2.
- Rheumatoid arthritis and other chronic infectious forms.
- Gonococcal arthritis.
- Spondylitis, Type B.

GROUP B3.
- True rheumatism, acute and subacute, and fibrositis.

In the diseases in Group A we find some features common to all; for example, little or no affection of the fibrous or synovial structures beyond effusion, but great changes in the cartilage and bone, for both of them may show irregular destruction and abnormal overgrowths—that is, not adapted to the functions of the joints. The cause of most of these diseases is disputed, and as a rule there is no fibrous or bony ankylosis.

In Groups B1, B2, and B3 we find septic causes generally acknowledged. The chief incidence is on the fibrous and synovial tissues. In some the condition goes on to suppuration and its results, or the formation of specialized formations. In others it never does, but (in B2) to atrophy of all structures with fibrous overgrowth and ankylosis. In the third (B3) subdivision there are no permanent joint changes, but the tendency to fibrous affections outside the joints interferes for some time with perfect movement. Flat-foot and stiff joints may last for months, but the distinction due to the absence of permanent changes seems to me an absolute one. Again, in all of these diseases pyrexia and other so-called constitutional results of the septicaemia are prominent, but in none do we find hypertrophy or outgrowths of bone.

I must not discuss the endless names which have been lavished upon the affections in B2, such as rheumatic gout, arthritis deformans, etc., but would emphasize their septic, non-suppurative character. Spondylitis has been shown to be of different types, some belonging to Group A and others to B. I have seen specimens in the bones of the cave bear of the Mendips, and Elliot Smith found whole cemeteries of prehistoric men so affected that the wonder is how they could bury each other, and the population in the same sites is ravaged by the disease to-day. It is, perhaps, the most ancient disease known. It is so common in draught horses now that many of them can never lie down, and a broken back in them is often merely a fracture of the common lumbar ankylosis or ossified ligaments. I cannot learn that these animals ever suffer from hip-joint disease, though osteo-arthritis of the distal bones is common enough.

Cases of osteo-arthritis of the human hip form a clinical and perhaps a pathological group with a distinct character, but this is true only if we exclude hip affections due to Charcot's disease, real gout, and the various infectious diseases of Group B2 with their constitutional symptoms such as fever. In this last type other joints are nearly always involved, though occasionally we find a gonococcal hip alone in its suffering; even true rheumatism may leave some hip trouble for a time, but this finally clears up, and is not usually difficult to diagnose if the history is considered carefully.

Adams in 1857, in his treatise on *Rheumatic Gout or Chronic Rheumatic Arthritis*, divided osteo-arthritis into polyarticular and monarticular. Jones Llewellyn thinks it is always oligo-articular, asymmetrical, and usually confined to large joints. Adams gave to the hip-joint type the name of "morbus coxae senilis" as early as 1837, but afterwards found so many cases of it at 30 or 40 years of age that he tried to blot out the name. I have recently seen some twenty cases in patients varying from 29 to 70 years of age, and have been struck with the way in which they get labelled sciatica; with the little pain usually complained of, which is so unlike the classical accounts of morbus coxae senilis, where the pain is described as persistent and violent; and above all with the perfect good health of most of them. They may complain that they cannot lace their boots or put on their stockings, and that they have stiffness or limited movement in one or both hips with a feeling of fatigue or pain in the morning and after prolonged exertion. The disability may increase until little or no movement takes place in the joint, and if both hips are thus affected they can hardly separate their feet or move one foot in front of the other. Their helplessness and imprisonment becomes very serious and depressing and the outlook most gloomy.

Sometimes the limb presents an exact picture of an impacted fracture of the neck of the femur with rotation outwards and apparent or real shortening. This was the case with Matthews the comedian, who was thrown from his gig and lamed. Ten years later he died and his bones were shown at a medical meeting by Adams, who demonstrated that the supposed fracture was merely this disease.

Compared with these monarticular cases, the instances of rheumatoid arthritis, where the hip is only one of the joints affected, are far more numerous, and the prognosis of the hip seems to be actually better. For the tendency in rheumatoid arthritis is to pass after years of suffering into a state of quietude with deformed and ankylosed joints. Now the hip being less disorganized than the small joints will sometimes recover surprisingly when the septic fire has burnt out.

I must confess that some authors think that osteo-arthritis of the hip may follow similar changes in other joints, or that an extension to other joints may follow it. Jones Llewellyn goes farther, and quotes Preiser as saying that fourteen cases of this hip affection have been found in children in Germany. However, I have never seen it in children, and I doubt whether it ever extends to other joints.

Symptoms.

I will now consider the symptoms commonly encountered.

1. There is *stiffness at the joint.* The patient sits down with difficulty and cannot as a rule cross the affected limb over the other or lace his boots easily. There is a sense of fatigue which, with the stiffness, passes off under gentle exercise, but the patients are healthy and well nourished.

2. *Pain* is absent at first, and when it begins it is deep-seated in the groin and behind the trochanter, and it may become severe. Referred pains along the neighbouring nerves are common and important. More frequently they run down to the knee and along the outer side of the thigh. Meralgia paraesthetica of the external cutaneous may appear. J. Llewellyn remarks, "Simultaneous pains in the anterior crural, obturator, and sciatic are very indicative of this disease," and "lumbar pain from strain of the ligaments is often secondary but not prior to the hip trouble, which is the reverse of what is found in sciatica."

3. *Tenderness* of the capsule in the groin and at the back of the limb is common.

4. *Pseudo-locking* may happen at times. Here a sudden pain with a feeling of something in the joint may come on, followed by lameness for some hours. This has been variously attributed to synovial nipping or to subchondral foci of inflammation.

5. *Attitude.*—The patient by choice stands on the sound limb, and rests the toe of the affected limb on the ground with bent knee and eversion of the leg—external rotation. The pelvis is drawn up and the lumbar column is curved, with

* A paper read before the Bath and Bristol Branch of the British Medical Association.

convexity towards the diseased side. The patient walks with a limp, moving the foot forward with difficulty.

6. *Tonic Flexion at the Hip.*—When the patient lies supine on a table there is lordosis and an arched knee. If the knee is pressed down the lordosis is increased. This is an important test.

7. *Passive movements are limited*, even at an early stage. Thus extension, flexion, internal rotation, and abduction are hindered or impossible.

8. There is *shortening*, though less than it seems, and in later stages this may increase from absorption of the neck of the femur.

9. *Wasting* of the gluteal muscles, which does not occur in sciatica, and also of the thigh, may be present.

10. In later stages loud *grating* in the joint is heard and felt, and *exostoses* and *obliteration of the outline* of the joint are seen in skiagrams.

It is important to remember that the stiffness of gait and limitation of movements may be present long before any evidence of bony change is shown in skiagrams or otherwise. We may call these two stages the functional and the organic ones.

Pathology.

In fully developed cases the cartilage becomes roughened and softened, fibrillated and thinned, especially at the centre, while at the periphery it is thickened. Nodules of overgrowth appear and become calcified. Where the cartilage has nearly disappeared a layer of ivory-like bone takes its place, and this is often grooved by friction. This process is quite unlike that seen in chronic infectious arthritis, where "ulceration," perforation, and fibrous ingrowths appear.

Below the cartilage atrophy and absorption of bone takes place. The trabeculae are changed into fibrous tissue, and even the marrow, but new bony outgrowths are formed in places. Thus simultaneous absorption and production of bone goes on. As R. Stockman says, the process does not resemble any known inflammatory condition. He adds that it is hard to say whether the changes commence first in the cartilage or in the bone. Absorption of the neck of the femur may follow, and either rarefaction or condensation of the shaft. At a late stage the synovial membrane degenerates, but it is doubtful whether there is at first any hypertrophy.

The Causal History.

Jones Llewellyn points out that the disease often follows a strain or blow on the great trochanter, and still more often supervenes on a state of flat-foot, genu valgum, or an inequality of length in the two limbs. Any of these causes, he says, may prevent the joint surfaces from corresponding, the capsules and ligaments are strained, the synovial fringes hypertrophy and multiply. The synovial arteries show thickened walls and often an obliterated lumen. Mr. T. S. P. Strangeways, of the Research Hospital, Cambridge, in a private letter, tells me that this form of osteo-arthritis is more commonly seen in better-class patients. He would prefer the name of "arterio-sclerotic joints," and considers that the condition is associated with overuse, that a large proportion of his cases have been athletes, and are men who have ridden on horseback a great deal. The changes he finds on microscopic examination are fibrosis of the capsule and distinct thickening of the vessel walls. He considers that these changes may bring about changes in the nutritive value of the synovial fluid, which, he holds, in normal circumstances, is a source of nourishment for articular cartilage (see BRITISH MEDICAL JOURNAL, May 15th, 1920). In his opinion it is the alteration in the nutritive value of the fluid which leads to degeneration, fibrillation, and loss of elasticity of articular cartilage, followed by disintegration and exposure of the bone covered by the affected area. Thus the weight of the body is thrown directly on the bone of the articulation. This causes a thickening and condensation of the exposed area, and if the movements of the joint are maintained, polishing and eburnation follows.

This connexion with arterio-sclerosis is supported by some few observations. I believe that in some forms of uterine disease a local arterio-sclerotic change is not uncommon. If such a cause is operative we might expect to find osteo-arthritis frequently in the subjects of generalized arterio-sclerosis, but fully developed cases are not very common, though minute patches of degeneration in joints without clinical symptoms are frequently seen in skiagrams and at operations, the meaning of which is not clear.

There is no evidence of a neural origin of the disease such as is present in a Charcot's joint, and very little in favour of an endocrine source, though osteo-arthritic changes occur in acromegaly, and the closely allied knee disease seen in some menopause patients is often accompanied with myxoedematous changes. Garrod, too, has noted a brawny infiltration of the hands in some instances of multiple osteo-arthritis, of which I have seen cases. There is at first sight little to be said in favour of an infectious origin, but this theory has recently found much support in the researches of P. W. Nathan[1] and others. They claim to have shown that all the extraordinary changes in rheumatoid arthritis are due to the lodgement of streptococci and other organisms in the neighbourhood of joints where the circulation is least active. By the injection of haemolytic streptococci, pneumococci, and staphylococci into animals they assert that they have reproduced most of the joint changes found in man in rheumatoid arthritis (and, they add, in osteo-arthritis), both acute and chronic, inflammatory or degenerative, cases with general constitutional symptoms, or merely transient ones, followed afterwards by progressive joint disease, or by gradual recovery, or by recurring joint attacks. In these cases where the general symptoms are quite transient, the morbid process may be localized at a joint, if there is a focus of infection left near it, quiescent for a time perhaps but capable of fresh action long after the general health is perfect and the original wound or carious tooth has been sterilized. Thus in hip-joint disease they would postulate a transient general infection, an equally short infection of many joints, and a focus of infection left near one hip, which henceforward shows progressive changes, at first inflammatory and then degenerative.

We have, then, to compare two different views—the purely mechanical one of Strangeways from the cutting off of nutrition leading to the degeneration of cartilage and bones, and the irritation of bone by friction, on the one hand; with the infective theory, on the other, of continued inflammation and softening, followed by degeneration, all due to a local focus of septic organisms.

Certainly the large amount of bone destruction and softening spreading to a long distance is in favour of the latter view of a bacterial poison; but we ought, if this is true, to find frequently near the affected joints collections or foci of organisms like the nests of typhoid bacilli in the periostitis of typhoid, but this we do not do. Moreover, even in the earliest stages the morbid processes in osteo-arthritis and in rheumatoid or chronic infectious arthritis are so utterly different that it is difficult to accept a common cause. In the one there is an insanity or malignancy of growth, in the other an inflammatory poisoning and atrophy, followed by low form of fibrous repair. Both sides agree that organisms are not found in the joints, or indeed in the joints of true rheumatism. After all, interesting as the question is, the practical importance is perhaps small. Here is a joint which, whether or no there was once a primary bacillary infection, has none now, but owing to a strain or overwork has broken down and started on a degenerative course. Out of the many joints once exposed to a supposed infection, this one only has lost the power of resistance, or suffers from deficient nutrition. Could we on either theory prevent this, or can we check the process?

Treatment.

In the first place, we can endeavour to remedy any obesity, flat-foot, or original shortening of the limb which causes a strain. We can limit the amount of exercise or exertion, and when this is done in an early case the hip symptoms often clear up surprisingly. But this is not all. There is an increasing volume of opinion that if only cases can be diagnosed early enough, and at once given complete rest—for instance, by a long splint with a pair of crutches and a patten on the sound foot, complete cures may be obtained. Absolute immobilization of the joint is to be aimed at, though difficult to obtain even with confinement to bed. In fact, the patients may be treated, like those having tuberculous joints, with absolute rest from the beginning, before the joint becomes deformed and new outgrowths have developed. Hence the great importance of recognizing these cases at first and of avoiding any error, or mistaking them for instances of gout or sciatica.

[1] *Journ. Med. Research*, May, 1917, vol. xxxvi, p. 2.

We are apt to forget that there is not the tendency to ankylosis which exists in rheumatoid arthritis and makes immobilization so dangerous in that condition.

If we meet with cases already at an advanced stage or who refuse immobilization we can, besides correcting any deformity, apply a spica bandage or a leathern moulded splint, and then allow gentle exercise with the toes turned inwards. Radiant heat followed by massage is most helpful at all stages, and in advanced cases passive exercises may be added. Very great relief from pain is given by ionization with salicylates and iodides, hot sandbags, and inunction of salicylic acid ʒss, menthol gr. x, lanoline ʒiv, with paraff. mollis to an ounce, and some increase of mobility may follow. For drugs we should persevere with arsenic or thymus gland with or without the syrup of iodide of iron. Cheilotomy has been advocated by Sampson Handley, Wheeler, and others. It consists in disarticulating the head of the femur, cutting away the outgrowths, and adapting the head of the bone to the socket. Very good results have been obtained and a freely movable joint formed in young patients where bone changes are not active.

In other cases the joint has been excised and the head mortised to the pelvis with great advantage as to freedom from pain but with complete fixation of the joint.

RECURRENCE OF SYMPTOMS AFTER REMOVAL OF GALL STONES FROM THE GALL BLADDER.

BY

R. P. ROWLANDS, M.S., F.R.C.S.,

SURGEON TO GUY'S HOSPITAL.

It is commonly asserted that the results of cholecystostomy are very satisfactory, that symptoms rarely occur after it, and that secondary operations seldom become necessary. My experience, however, is that although this operation is a valuable one, often saving life and giving great relief, symptoms do return after it in a good many cases, and that the demand for secondary operations is far from uncommon. Many patients whose symptoms recur are so very disappointed that they lose faith in operations and prefer to suffer much rather than undergo a further one. During the last six months I have been asked to operate on four patients whose recurrent symptoms had become so intolerable that they abandoned their natural prejudices. I give below brief notes of three of these cases.

Like the appendix, the gall bladder is a vestigial organ which many animals are luckily born without and numerous human beings have lost without detriment. It is admitted to be by far the chief, if not the only, factory of gall stones, whose power for evil is very great. The infection which is the main cause of cholecystitis and the formation of gall stones is known to settle in the wall of the gall bladder and, in many cases, to be incurable by mere drainage. Chronic irritation of the gall bladder sometimes leads to cancer, which is not uncommonly discovered at an early stage on examining the organ after its removal. The hope of cure in these early cases of cancer is very good; one of my patients thus treated over ten years ago is well now.

It is very difficult to find and to be quite certain of removing every gall stone from the gall bladder, and more especially from the tortuous and indurated cystic duct, where a small stone is easily overlooked. Removal of the gall bladder and its duct is the only certain way of getting rid of all stones in these circumstances. This is well shown in Case I. Even if all the stones are removed by cholecystostomy, with or without incision of the cystic duct, stricture of the duct may ensue, causing a mucocele or empyema of the gall bladder or mucous fistula. Sometimes a biliary fistula or chronic jaundice follows kinking of the common bile duct due to the contraction of the inflamed gall bladder. If the latter contains pus or other infective matter it is much cleaner and often easier to remove it and its duct without opening them, thus avoiding the risk of infection of the wound, with delay of healing and weakness of the abdominal wall with ventral hernia. The persistence or recurrence of cholecystitis is not uncommon after cholecystostomy, with or without the formation of fresh stones. This point is illustrated in Case II. Although there were no stones the symptoms had closely simulated those of cholelithiasis. Secondary infection of the bile ducts and pancreas may ensue in these circumstances, causing jaundice or acute or chronic pancreatitis. It has been a common but mistaken belief that draining is always safer than excising a diseased gall bladder, but experience proves that, with a proper selection of cases and a good surgeon, the reverse is true. Thus the mortality of 2,493 cases of cholecystectomy performed at the Mayo Clinic between 1907 and 1916 was 1.3 per cent., and that of 2,854 cholecystostomies was 1.5 per cent.

It is clear that, for disease limited to the gall bladder and its duct, cholecystectomy is more radical than cholecystostomy. It is, however, not invariably the easier and safer operation. Much depends, as I have said, on the wise selection of suitable cases and upon the skill and experience of the surgeon. In acute cases, when the patient is very ill, old, or feeble, when the gall bladder is very inflamed, distended, and adherent, when inflammatory oedema makes it difficult to identify the bile ducts, the surgeon—especially if he is not very experienced in this branch of surgery—will be wise to choose cholecystostomy as the safer operation in the circumstances. It will probably save life, and, if care be taken to remove all stones, the ultimate result may be satisfactory. If serious symptoms recur a secondary cholecystectomy can be performed, in a quiet period, under more favourable conditions.

It must not be forgotten, however, that these secondary operations may be very difficult owing to the disturbance and confusion by adhesions of the normal anatomy of the complicated biliary apparatus. It is very clear that the surgery of the bile apparatus, like that of the stomach and duodenum, is not to be lightly undertaken by the amateur or the novice. The interests of the patient, as well as the good name and honour of surgery, demand special skill and experience from the surgeon who undertakes this work, for it is impossible to tell what difficult and unexpected problems may present themselves and have to be promptly solved when the abdomen is opened. These operations, sometimes so easy, may, on the other hand, be among the most difficult and hazardous in surgery. When medical men realize these facts we may hope to see fewer bad results and secondary clearing-up operations, such as cholecystectomy and choledochotomy, for the removal of stones left in the common bile duct, and the repair of fistulae or strictures following injuries of the bile ducts. To avoid the last named, constant vigilance and an accurate knowledge of the anatomy of the bile ducts are required. It is necessary to identify the common bile duct quite clearly before proceeding to remove the gall bladder.

There is more room for doubt about the indications for cholecystectomy when the disease (especially cholelithiasis) has extended into the main bile ducts. It is evident that the gall bladder should not be removed unless it is certain that the common bile duct is patent and likely to remain so. It is also clear that it is too risky to be undertaken when the patient is very ill, old, or feeble, and especially in the presence of jaundice which has lasted long enough to diminish the coagulability of the blood—as shown by a previous estimation of the clotting period—thus adding the possibility of uncontrollable bleeding to the dangers of the operation. No one, again, would suggest the removal of the gall bladder when infective cholangitis exists, for in this grave condition the only justifiable operation is the removal of stones and the drainage of the common bile duct, and even this should, if possible, be deferred to a quiescent period, when the risk is much less. Under favourable conditions, however, when the bile ducts are patent, it is very advantageous to the patient to have the diseased gall bladder removed, and thus to be saved from the probable recurrence of symptoms, with or without a subsequent radical operation.

CASE I.

A. C., aged 53, a powerful, stout man, had had cholecystostomy performed for acute cholecystitis in August, 1921, through a long vertical incision made below the ninth right rib cartilage. The operation was said to have been a difficult one, but it was thought that all the stones had been removed. Recovery was slow, but ultimately the man returned to work. He was readmitted into hospital before Christmas for return of symptoms, but these abated, and he was sent out without further operation. A few days later he was laid up with fever (? influenza, probably cholecystitis). Another attack came on soon after, with violent pain in the right hypochondrium and slight jaundice. The gall bladder could not be felt, but there was general rigidity and dullness in the right hypochondrium. An immediate operation was advised, but the patient would not undergo it until he was promised that every endeavour would be made to make it final and radical.

Operation (January 16th, 1922).—Kocher incision. Very dense adhesions were found between the liver (lower edge) and the

parietes, and much blood-stained bile below and above the right lobe of the liver. The adhesions were separated with great difficulty. The gall bladder was empty and had perforated on its lower surface. Although the foramen of Winslow was defined it was impossible to palpate the common bile duct to decide if there were any stones in it, owing to the great inflammatory oedema of the subperitoneal tissues and of the head of the pancreas. A small stone was felt in the cystic duct, and this was extracted with difficulty, after opening the duct. No more could be felt. The common bile duct was opened and a large olive-headed probe was passed into the duodenum and up into both right and left bile ducts without difficulty and without encountering any stone.

Although the patient was very ill it was felt that he would not remain well unless the gall bladder was removed. This was done with difficulty, owing to adhesions and inflammatory changes about the ducts which made it difficult to define them. When the gall bladder had been removed another small stone was found in the cystic duct. This was a great surprise. The common bile duct was drained and the patient made a good and rapid recovery. He has remained quite well since.

CASE II.

Mrs. H., aged 49. There was a history of repeated attacks of hepatic colic, without jaundice, since 1917. Cholecystostomy was performed elsewhere in November, 1919, and seventy-two stones removed. The patient remained well until February, 1922, when attacks of very severe pain recurred at frequent intervals, each attack lasting from half an hour to three hours. There was no jaundice.

Operation (March 15th, 1922). — Cholecystectomy performed. There were no gall stones, but a greatly enlarged, folded, inflamed, and adherent gall bladder containing mucus and bile. A chronically inflamed appendix was also removed. The patient made a good recovery.

CASE III.

Mrs. K., aged 64, had had cholecystostomy performed elsewhere in 1914. In 1916 the attacks of biliary colic recurred, and during the next six years she had six severe and many minor attacks. They were attended by nausea, vomiting, and flatulent distension.

Operation (May 25th, 1922).—Cholecystectomy performed. The gall bladder was found to be full of stones, and several were also removed from the common bile duct. The patient did very well.

A CASE OF HAEMOCHROMATOSIS.

BY

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I VENTURE to publish this short account of a case of haemochromatosis for three reasons: (1) It was possible to obtain a fairly accurate clinical history of the patient's previous illnesses and of the onset of the fatal disease. (2) The clinical data observed during the last stages were interesting. (3) It seems to me that the case opens up new ground in connexion with this somewhat rare disease.

G. H., a man aged 42, was brought up on a farm, and was one of a large and healthy family. As a child he had a severe attack of scarlet fever, followed by acute haemorrhagic nephritis, which completely cleared up. At the age of 25 he was athletic, well developed, and active physically and mentally. He was appointed works manager in a large engineering firm at the age of 27. His complexion was always sallow (olive), and this colour was universally distributed over the whole skin. On one occasion, fifteen years ago, whilst bathing, this discoloration of the skin was markedly noticeable and was joked about. Five years ago, at a large daylight meeting in a neighbouring town, his doctor, who was acting as door-keeper, on looking up at the gallery noticed his patient's face stand out as a greenish-yellow blotch amongst all the others. His health remained fairly good, except for occasional attacks of dyspepsia, which were characterized by sleepiness and heaviness in the morning, but as far as I can gather were not accompanied by abdominal pain or vomiting. On one occasion calomel was prescribed and acted with extraordinary vigour.

In 1916 an abscess developed on the dorsum of the right foot. This was followed by other abscesses in various parts of the body, and finally by a prostatic abscess, which burst into the rectum. *Bacillus coli* was found to be the causative organism, and he was treated by vaccines, which did not, however, prevent other abscesses developing. The discoloration of the skin varied in depth according to his general health, becoming much lighter after a month's holiday. It may be mentioned that he always took "Fellows' syrup" as a tonic when he felt run down, but I have no data as to the effects of this substance upon the pigmentation of the skin.

In December, 1921, he first consulted me because he felt tired after exercise, and had insomnia, and cramps in the legs. Examination showed nothing abnormal, except that the liver extended 1½ inches below the costal margin, the edge being hard and well defined. The spleen was not palpable. It was easy to examine the abdomen as the muscles were not at all rigid. The urine contained 7 per cent. sugar, but no albumin, acetone, or diaceto-acetic acid. He was gradually dieted down to meat, eggs, green vegetables, butter, and 4 oz. of bread daily; but the urine still contained about 7 per cent. sugar, and the quantity was 5 pints daily. He then went to an institution for treatment, where he stayed about three months. The report on admission was as follows: "Height 5 ft. 11½ in. Weight 11 st. 2 lb. Pale, thin, and tired-looking. Pulse 68. Systolic blood pressure 114 mm. Hg. Blood 90 per cent. Hb; red cells 4,450,000 and white cells 3,200 per c.mm.; blood sugar, 0.34 per cent. Faeces normal. Urine (twenty-four hours) 2,856 c.cm.; specific gravity 1035, acid, sugar 157 grams, traces of acetone and aceto-acetic acid, Albumin, a faint trace." The fat was restricted and followed by a two days' fast in bed; a little protein was then allowed for three days, followed by another fast for two days. After the second fast the urine was sugar-free. Food was then allowed, starting with proteins only. Glycosuria returned with 80 grams protein, 3 grams carbohydrate, and 3 grams of fat. The diet was gradually increased, the fat and carbohydrates being kept low and a fast day instituted once a week. On this régime the sugar in the urine fell to a trace on the fast day, rising to 100 grams by the end of the week. The blood sugar fell to 0.19 per cent. during the fasting; subsequently it varied between 0.24 and 0.40 per cent. There was no appearance of acetone or aceto-acetic acid. On leaving the institution his weight was 9 st. 10½ lb., a loss of 19½ lb. His thirst had almost gone, and he felt stronger. When he returned home his teeth, antra, and sinuses were examined, but no septic foci were discovered.

In April, 1922, the liver was markedly enlarged, to the level of the umbilicus, hard, with signs of lobulation in the epigastric area. The spleen was easily palpable. From this time until his death in June, 1922, the urine was repeatedly examined for acetone and aceto-acetic acid, but the result was always negative, despite the fact that for the last two or three weeks he was in a semi-comatose condition. During this time darkish pigmentation appeared, chiefly round the elbows and on the hands. The following diet and urine chart may be of interest:

	Carbo-hydrate.	Protein.	Fat.	Urine.
	Grams.	Grams.	Grams.	
April 6th	30	198	42	6½ pints; 2.8% sugar.
April 18th	42	201	54	7½ ,, 5% ,,
May 12th	14	186	19	7 ,, 6% ,,

He was now allowed 40 grams of white bread daily, and later this was increased to 60 grams, together with 5 oz. of milk. After the semi-comatose condition was established he practically lived upon skimmed milk and soda-water. He became gradually weaker, and died from exhaustion on June 8th. He was quite conscious just before his death.

A complete *post-mortem* examination was out of the question, but a portion of skin from the back of the hand was examined and showed a well-marked reaction for iron. The dark pigmentation was most marked over the backs of the hands, the elbows, and shins, and on the genital organs.

I desire to thank Dr. J. Orton of Coventry and Dr. A. P. Thomson of Birmingham for their valuable help in writing this short record of the case.

I would draw attention to several points in this case which strike me as being particularly interesting.

1. Did the attack of nephritis in childhood, which cleared up, have anything to do with the subsequent disease? Could it have left the kidney uninjured except for difficulty in excreting iron?

2. The fact that the patient's colour altered considerably at different periods appears to show that if this disease is due to loss of renal excretion of iron, then the loss is not total.

3. Although in a semi-comatose condition with a glycosuria of 7 per cent., there was no sign of aceto-acetic acid or acetone in the urine. I think we may presume that the pancreas was almost totally destroyed; if so, then there must be some other unknown cause for the presence of acetone in the urine of ordinary diabetics.

4. Cases of haemochromatosis are probably more common than we think, and could be diagnosed at an early stage after the peculiar colouring of the skin has become noticeable. I have no doubt that careful dieting would enable them to live for longer periods, and useful lives might be prolonged.

THE late Mr. A. D. Serena, of York Terrace, Regent's Park, who left net personalty of £374,214, bequeathed £10,000 free of duty to the London Hospital. After paying certain legacies the remainder of the estate is to be divided among some forty-four charities, including the following hospitals: London, Charing Cross, King's College, Guy's, Middlesex, University College, Royal Free, St. Bartholomew's, St. George's, St. Thomas's, St. Mary's, Royal Northern, Royal Hospital for Incurables, Poplar Hospital for Accidents, Hospital for Consumption and Diseases of the Chest, Fulham Road, Cancer, Chelsea Hospital for Women, Queen Charlotte's Lying-in, Hospital for Sick Children, Great Ormond Street, Lock Hospital, Harrow Road, and the Italian.

NINETIETH ANNUAL MEETING
OF THE
British Medical Association.
Held at Glasgow, July, 1922.

PROCEEDINGS OF SECTIONS.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE.

Professor G. M. ROBERTSON, M.D., F.R.C.P.Edin., President.

PRESIDENT'S INTRODUCTORY REMARKS.

THE PRESIDENT, in opening the proceedings, deplored the separation of neurology and psychology, which was disastrous for both, and welcomed the combination of the Sections at the present meeting. Psychotherapy came to the fore during the war, the public taking a great interest in it, and the medical profession should express itself clearly on the subject. Psychotherapy was the oldest form of treatment—the methods of cure in the Bible were psychotherapy pure and simple; the successful medical man was the successful psychotherapeutist, though he might not know it.

DISCUSSION ON PSYCHOTHERAPY.

OPENING PAPERS.

I.—PSYCHOTHERAPEUTICS AND PSYCHOPATHOLOGY.

BY
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DURING the war and in the years that have passed since its close, much interest, both popular and scientific, has been shown in the principles and practice of psychotherapeutics. Newspaper accounts of lightning cures of "shell-shock" soldiers, effected by means of suggestion or persuasion, excited the popular imagination; reports of the beneficent results of "abreaction" and the reassociation of lapsed memories gave rise to a considerable amount of discussion in medical and psychological circles; and the widespread acceptance of "repression" as the cause of mental dissociation gave rise to the erroneous belief that psycho-analysis was extensively used in the treatment of the war neuroses. The general public—and, indeed, a not inconsiderable number of the medical profession—became hopelessly confused; for the most responsible newspapers in the chief city of the empire promulgated day by day the wildest nonsense regarding the doctrines and the practice of psychotherapeutics.

It is hardly our business here to correct the false impressions thus produced on uninstructed minds, but a meeting of this Section affords a good opportunity of discussing among ourselves the principles and methods of psychotherapeutics and of trying to come to some agreement as to what is and what is not sound theory and good practice.

In the history of medicine the development of rational therapeutics has taken place alongside of, and in closest dependence on, the growth in our knowledge of pathology; and a psychotherapy that is not based upon psychopathology can be little more than pure empiricism. Although the empirical use of psychotherapeutical measures has been practised from the earliest days up to our own time, there are good grounds for thinking that treatment through the mind has at last emerged, or is emerging, from this phase and is now assuming its rightful place as a branch of rational therapeutics. But perhaps this can fully come to pass only when psychopathology is also accepted as a necessary part or aspect of general pathology.

Yet in so far as pathology is a study of the proximate causes of disease, the notion of a psychopathology—which in this connexion implies mental causation of disease—must be a shibboleth to many psychiatrists and neurologists. For they have been trained to believe that all disease, whether of body or of mind, must have origin in morbid structure or function of the bodily organism; and even those who profess belief in a strict parallelism of neural and mental states—a parallelism which entails absolute concomitance of neural and mental events—seem often to hold, as a sort of overbelief, that neural change precedes the mental change, be it by ever so little, in both normal and psychopathic states.

Those who explicitly or implicitly hold this view would save themselves much inconvenience in their approach to the problems of psychotherapeutics and psychopathology if they would realize that insistence on the invariable priority of bodily change in bodily or mental disorders is an unwarrantable intrusion of metaphysics into the realm of science; and if they are not able, for methodological purposes, to adhere, in thought and language, to a consistent parallelism, they would perhaps do well to use the language of everyday life in their references to the relations of body and mind.

The common sense of mankind has always held that there is a real and close relation between the mind and the body, and it accepts, without question, the causal nature of that relation. It maintains that states of mind are caused by states of body, and that states of body are caused by states of mind. Common sense holds that mind and body interact, one with the other, and in all our conduct this belief is tacitly assumed.

By using the language of everyday life and common sense we are able to consider all departures from health, whether of body or of mind, from the point of view of psychical causation; and we may thus extend, if need be, the sphere of psychopathology beyond that to which it is ordinarily confined—namely, the psychoneuroses and the psychoses. We may, for example, consider seriously the part played by the mind in the causation of many bodily disorders which are not ordinarily regarded as having any other than a purely physical origin. Some justification for so doing is afforded by a consideration of the results obtained in the treatment of these conditions by the various psychotherapeutic measures which are now included under the term "suggestion." The extent to which psychotherapy is of value in dealing with functional and even organic bodily disorders is perhaps not fully appreciated, except by those who have made extensive use of suggestion in general practice.

It is commonly assumed that, if any mental or bodily disorder can be relieved by influences acting through the mind, the mind must have played a part in the production of such disorder. But if we believe in the possibility of a true interaction between mind and body such an assumption is unnecessary, and we may suppose that, just as bodily disorders lead to mental states, such as depression, so mental states, such as joy, lead to bodily well-being.

The facts in support of the assumption that what is relieved through the mind must have had its origin in the mind are mainly derived from our knowledge of conversion hysteria, and of the efficacy of suggestion in relieving the physical symptoms of this malady. But generalization from the results obtained in these cases, and assertion that these results are identical with those obtained in cases in which the existence of conversion hysteria has not been suspected, may be wholly unwarranted; and by too ready acceptance of such a generalization we may miss something that is of real importance regarding the relation of mind and body in health and disease.

If it be true that relief of a bodily symptom by psychotherapeutic measures is proof of the psychogenetic origin of such symptoms, or of the presence of conversion hysteria, our experience of the use of hypnotic suggestion, in cases of all sorts met with in general practice, would compel us to come to some strange conclusion regarding the prevalence of conversion hysteria. If every symptom that can be relieved by suggestion is evidence of the presence of hysteria, then it must be believed that 80 to 90 per cent. of our patients in general practice are suffering from hysteria.

Let us take an example: there is perhaps no more common instance of faulty bodily functioning than habitual constipation; and the *cure* of this condition, by material remedies alone, is perhaps impossible. On the other hand, almost every case of habitual constipation in which hypnosis can be induced may be cured by suggestion without the use of any material remedies whatsoever. Or, take another example; an apparently healthy young woman gets badly scalded by the upsetting of a kettle of boiling water. The wound is appropriately dressed and, during

hypnosis, absence of pain and rapid healing are suggested. There follows a sequence of events frequently recorded in experimental work on hypnotic suggestion: no pain is experienced, no inflammatory area develops, and the injured part heals with unusual rapidity.

In dealing thus with a burn the injured part is kept at rest and it is protected from morbid agencies from without by appropriate dressings. But the securing of such rest and protection is perhaps the sole biological function of pain and the reason for its arising in the course of mental evolution; and when this necessary condition of healing can be secured in other ways while pain is eliminated by suggestion, we get a better result than we do when the same precautions are taken but pain is experienced. It would seem as if the processes involved in the production of the pain which in a state of nature is necessary to ensure protection and rest of the injured part were in themselves inimical to the healing process.

Here, then, we have two examples of the part played by mental influences in effecting bodily changes which can hardly be claimed as instances of conversion hysteria. I refer to them because at the present time there is a tendency to forget the work of the hypnotists in the treatment of functional bodily disorders, and to judge the value of suggestion as a therapeutical agent by the transitory effects of its use in the psychoneuroses. Indeed, for many, the psychoneuroses seem to constitute the only domain in which psychotherapeutic endeavour is justifiable or effective; and if the field of psychotherapeutics is thus restricted there is some danger lest the forms of psychotherapy most useful in dealing with the psychoneuroses may be regarded as the only valid psychotherapeutic measures, while those that are of little or no value in the psychoneuroses may be declared useless in all conditions whatsoever.

There are two circumstances which are especially conducive to these errors at the present time. It must be remembered (1) that many of those who are now practising psychotherapeutics had little or no knowledge of this branch of treatment prior to the war, and (2) that practically all the war cases they were called upon to treat were cases of neurosis, psychoneurosis, or psychosis. And in the years that have passed since the end of the war these workers have probably had little opportunity of testing the value of psychotherapeutic measures in any conditions other than these. Their views on theory and on practice are thus apt to be unduly biased by their war experience; and because of the mere numbers with which they had to deal they are prone to generalize too freely in respect of the use of psychotherapeutic measures in civil practice.

Much of the treatment by suggestion in recent years has not, however, been "hypnotic suggestion"; that is to say, no formal attempt to induce hypnosis is made before curative suggestions are given to the patient. A state of rest and relaxation is considered sufficient for this purpose, and it is commonly held that the results so obtained are not inferior in any way to those recorded by the exponents of hypnotic suggestion. Moreover, many men who practise psychotherapeutics have never been able to reconcile themselves to the formal use of suggestion, even apart from the employment of hypnotism. They have felt that it savoured too much of the quack or the miracle worker, and they have been doubtful of the value of any method which brings about faith or belief without an appeal being made to the patient's reason or intelligence. Consequently we find that therapeutic systems in which chief stress is laid upon persuasion and re-education of the neurotic patient have been widely adopted; and since it was found that when such appeal to the reason is made results are obtained which are as good or better than those recorded by the hypnotists, it was thought that the appeal to the reason is the essential feature of this method, and that the patient's recovery is due to his rational acceptance of the explanation given by the physician.

But we know that the explanation given to the patient need not be the true one; what is necessary is that the patient should believe it to be the true one. Failure or success depends on the extent to which the physician is able to instil faith into the patient's mind, just as is the case in all forms of suggestion. Indeed there can be no doubt that treatment by persuasion is treatment by suggestion, and that even the benefits derived from re-educative efforts are largely due to the same subtle influence.

In order to give to the patient any reasonable explanation at all, some greater degree of investigation into the nature and origin of the illness than is necessary for treatment by suggestion has to be undertaken; and this fuller inquiry may in itself have a certain curative influence, both by the increased confidence or faith in the physician, engendered by the meticulous care with which he examines his patient, and also by the opportunities offered to the patient of giving vent to emotion in his recapitulation of the events that have led up to his illness.

But the most important clues to the origin and nature of the illness are not within the patient's power of conscious recollection, and, just in so far as they cannot be recalled, the physician's knowledge of the malady is incomplete and his explanations inadequate. In the treatment of the war neuroses it was soon found that suggestion or persuasion was often a very unsatisfactory mode of treatment and, in the common psychoneurotic disorders in which amnesia was the most prominent accompaniment of the physical disability or mental disturbance that incapacitated the soldier for duty, it was generally found necessary to adopt some other means of restoring him to health. The importance of reassociation of the dissociated memories was quickly perceived, and hypnosis as a means of discovering them, and suggestion as a means of restoring them to consciousness, were very widely used.

Some workers revived Breuer's method of abreaction and they believed that the freeing of repressed emotions thus secured played an important part in the restoration of lost memories to consciousness and in the consequent recovery of the "shell-shock" soldier. On the other hand, some workers got equally good results by bringing about reassociation of the dissociated memories without any display of abreaction. Thus it would seem that the essential feature of treatment by abreaction is the overcoming of the amnesia which is so prominent a symptom in traumatic psychoneurosis.

In thus directing therapeutic efforts towards the annulment of the mental dissociation which reveals itself in amnesia, an approach is made towards a rational treatment of the psychoneuroses. For we have here that correlation between pathology and therapeutics which is the distinctive mark of scientific as opposed to merely empirical modes of treatment. In using suggestion in the form of mere denial of the symptoms or prognostication of their speedy disappearance, our procedure, although it may be effective, has no rational foundation; or if it appears to have some rational basis, this is due to a false or superficial conception of the psychopathological processes at work in the production of psychoneurotic symptoms. It is true that if we believed with Babinski that all hysterical symptoms are due to "bad" suggestion it might seem reasonable to counteract its consequences by giving "good" suggestion (or, as he would call it, persuasion); but very little knowledge of the psychopathological mechanisms concerned in the production of hysteria is sufficient to convince us of the superficiality of Babinski's views. On the other hand, the conception of mental dissociation which we owe to Janet is of outstanding importance in psychopathology, and its validity is now almost universally accepted. Indeed, it may be said that dissociation is the most fundamental conception in psychopathology, and that the restoration of lost memories is the ultimate goal of all psychotherapeutics.

There would appear to be no conditions in which the occurrence of dissociation might be more readily accounted for than in the neuroses of war. For the strain and stress of life in the trenches, or the shocks and calamities of battle, would indeed seem sufficient to disintegrate the most stable of minds. Janet has taught that dissociation is due to lack of mental synthesis consequent upon a lowering of nervous tension; and if the shocks or stresses of civil life are sometimes sufficient to cause a lowering of nervous tension and a consequent retraction of the field of consciousness, how much more readily would the conditions of modern warfare tend to bring about such a result! And yet we know that almost all those who dealt with the war neuroses on psychological lines accepted the Freudian doctrine of mental conflict and repression as being the immediate cause of dissociation, and that they laid little stress upon the factors described by Janet.

The failure of suggestion, persuasion, and abreaction in the more severe war cases which were treated in the home hospitals constrained medical officers to examine more closely the nature of the dissociation present in those patients and the factors concerned in its production. For the incidence of dissociation—the mental material on which it bears—varies greatly in different psychopathic states. In the war neuroses to which the method

of abreaction was most commonly applied dissociation was, as a rule, a dissociation *en masse* of a more or less definite section of conscious experience. All the experiences of a day or a week or a month or a year became disrupted from the conscious personality, so that the memories related to them could not be recalled; but in many psychopathic disorders the dissociation is of a more discrete character and the elements on which it bears are bound together by associations more subtle than those that depend upon mere contiguity in time.

When there is dissociation *en masse*, of recent origin, hypnosis is always very easily induced and the lost memories may arise spontaneously or be readily recalled in the hypnotic state. By suggestion or other technical devices they may be carried over into the waking state and become reassociated with those of the normal personal life. But when manifest amnesia is not a prominent symptom in the psychoneuroses, no such dissociation *en masse* is to be found. It is not, however, to be supposed that dissociation and amnesia are not present; the dissociation is there, but it is of a more complex nature; its origin is more remote and is more deeply rooted in the past. In these cases the induction of hypnosis may be more difficult; and, when hypnosis can be induced, it is found to afford little insight into the nature of the amnesia, and to give little assistance in relieving the psychoneurotic disabilities which are present.

In the treatment of many war cases of this kind some sort of analysis of the mind of the patient was seen to be necessary, and, since there was already in existence an extensive literature in which the use of mental analysis of some kind or another was described, it was to be expected that war workers would take advantage of their opportunities of testing the various methods and theories put forward by different schools. This, to a very large extent, they did, and we have had records of mental analyses, some of which were nothing more than a detailed anamnesis; some in which the conscious recollections were supplemented by memories revived during hypnosis; some in which the word-association test was used to set the investigator on the track of some buried complex; some in which the methods of psycho-analysis were more or less consistently employed; and some in which these methods were transcended and the data obtained by their use reinterpreted in the light of mythology and religion.

Behind all this activity in the domain of mental analysis, and overshadowing it, stood that body of doctrine associated with the name of Sigmund Freud. The great majority of the war workers in psychotherapeutics could not get away from it and they could not accept it. The truth of some of the tenets of the Freudian school was borne in upon all competent investigators, including even some of the neurologists. The psychogenetic origin of the war neuroses was by many reluctantly conceded; the principle of mental dissociation was widely accepted; the psycho-analytical doctrine of neurosis as a "flight into sickness" with a view to satisfactions that could only thus be obtained was readily adopted—perhaps because of its seeming agreement with the popular notion that all neurosis is malingering, rather than as a well-attested scientific hypothesis. But what seemed to me the most striking feature of the psychotherapeutic practice of war workers was the extraordinary unanimity shown regarding Freud's theory of repression, combined with a rejection of almost the whole body of doctrine erected on this foundation by Freud himself. The seemingly clear demonstration afforded by a superficial analysis that the traumatic neuroses of war could be adequately accounted for in terms of mental conflict and repression in which instincts other than those called sexual by the psycho-analysts were alone concerned led many able men to the logically untenable conclusion that the *libido* theory of the neuroses was thereby proved false. A strange eagerness was shown in bringing forward this conclusion. It looked as if those who upheld it thought there was some special virtue in dissociating themselves from a sexual etiology of the neuroses. We had the strange spectacle of men of science apparently being influenced by the notion that one explanation of any natural phenomenon may be more respectable, or ethically more worthy, than another—a strange spectacle, but one not unique in the history of science. We may call to mind the reception given to Darwin's theory of the origin of species: the contemporary records of the discussions initiated by the epoch-making hypothesis of natural selection bear a strong resemblance to those of our own time regarding Freudian doctrine. Psycho-analysis throws an illuminating light upon the mental processes at work in uncritical rejection of what ultimately may prove to be scientific truth. In science, more truly than in life, we see the force of the poet's contention that "they were dangerous guides, the feelings"; and of each of us it may have to be said that, at some time or another, he himself "was not exempt."

Yet if we can overcome our resistances to the *libido* theory of the neuroses, if we can bring ourselves to examine dispassionately the evidence on which the theory has been built up, we cannot fail to see and be astonished at the light that it throws upon the psychology of abnormal mental states and the order and coherence that it brings into a department of pathology hitherto characterized by obscurity and confusion. For, quite apart from all consideration of psycho-analysis as a therapeutic method, its painstaking examination of the neurotic mind has brought us at last a genuine psychopathology in which the morbid structure of the psychoneuroses is laid bare and the processes by which their development takes place are revealed. It must be remembered, however, that all the most definite and best established formulations of psycho-analysis have been obtained from the study of the transference neuroses—conversion hysteria, anxiety hysteria, and compulsion neurosis—and that the application of the *libido* theory to the psychoses and to the traumatic neuroses has only recently received adequate consideration. Such progress as has already been made has been rendered possible by the recognition of the part played by *narcissistic libido* in the production of these states.

There are various grounds for the opposition which so many people feel towards the doctrines of psycho-analysis, and some of these grounds may be made more clear and their validity may be more justly appraised if we draw a distinction between psycho-analysis as a method of investigation in psychopathology and psycho-analysis as a therapeutic measure. For it may reasonably be maintained that the aims of pathology and the aims of therapeutics are different, and that our criteria of values may change according to the ends we have in view.

If we can bring ourselves to study the structure of a mind that has gone astray in its development, without any feelings of responsibility towards a fellow creature in distress who has sought our aid, we can, without compunction, adopt the purely scientific attitude which the pathologist brings to his work in the *post-mortem* room or the physiologist to his experiments on an anaesthetized animal. But the psycho-analyst as a therapeutist, unless he is quite sure of himself and of the validity of his methods, is rather in the position of a surgeon about to perform a major operation for the first time. He can hardly refrain from thoughts of the possible outcome of his work; he cannot avoid feeling that the life or well-being of his patient is in his hands; he cannot help being oppressed by his responsibility towards one who has trusted him and turned to him for help. And just as considerations of these kinds may stay the hand of the surgeon from operative procedure which is too risky, so the psychotherapeutist may regard as a violation of the patient's mind those investigations which as psychopathologist he might ardently wish to make.

Here we have what appears to me to be the chief difference between the standpoint of the man of science as mere investigator and the same man as therapeutist, and the difference in these standpoints may account to some extent for the different considerations which may affect his attitudes or beliefs, in respect to psycho-analysis, according as he approaches the subject in the one rôle or in the other.

If we take, for example, that feature of the Freudian psychology which more than any other has aroused opposition—namely, the supreme importance ascribed to psycho-sexual tendencies in the life and growth of the mind—there would seem to be no reason why a psychopathologist, in the seclusion of his study, should not readily recognize a truth for which all his biological training must have in some degree prepared him. But if it is a question of his making use of the truth so realized and of applying it in the treatment of the neuroses, there are many powerful forces at work in his mind which may not only prevent him from doing so, but may even compel him to repudiate the truth which, for a moment, he had clearly discerned.

But although there would appear to be no reason why a psychopathologist, as such, should have any feeling of repugnance towards the *libido* theory of the neuroses, yet we know, as a matter of fact, that all men have resistances against bringing

into the light of day that side of human nature which morality and religion have decided shall be taboo; and not until we have overcome these resistances are we able to take up an objective attitude towards the doctrines of psycho-analysis. It seems to me, however, that it is easier to overcome resistances to psycho-analysis as a body of doctrine than to its use as a method of therapeutics. The truth of this is perhaps exemplified in the attitude taken up by Jung and his followers towards psycho-analysis; for they seem to accept the truth of its psychopathological findings while they deny that it is a justifiable or efficacious therapeutic measure.

There is one curious ground of objection to psycho-analysis which has not infrequently been put forward—namely, its insistence on a "thorough-going determinism." And here again, I think, it may be useful to consider this objection from the side of the psychopathologist on the one hand and from that of the psychotherapeutist on the other. The psychopathologist is a man of science, and *qua* psychopathologist he has no temptation to be anything else; but the psychotherapeutist may feel it incumbent on him to play the part of a moral or spiritual director to his patient. To the man of science determinism is a necessary postulate of all his investigations: the reformer and the priest cannot abandon belief in human freedom without stultifying all their precepts.

The psychopathologist can therefore have no possible ground of objection to psycho-analysis because of its determinism; on the contrary, it is the strictly determinist standpoint of the psycho-analyst which alone makes it possible for his findings to be regarded as suitable material for scientific study. It may be pointed out, however, to the analyst who feels the need to retain his belief in freedom, that he also may accept the determinist standpoint in his examination of a patient's past mental history, however much he may believe in the indetermination of its future. For even if we admit the reality of the freedom of choice which our moral nature demands, "we can confidently lay it down that no event will ever occur which will not seem intelligibly connected with its antecedents *after it has happened.*"[1]

The psycho-analyst's insistence on the determinism of psychic events is primarily an insistence on the plea that the methods of science are applicable to the study of the human mind. But there is no need whatever to raise the metaphysical problem of the freedom of the will in regard to psycho-analysis as a branch of science. Freedom is a postulate of ethics: determinism is a postulate of science; and no good can come of trying to introduce ethical or moral considerations into the purely scientific investigation of the mind—a tendency at present all too common in relation to psycho-analysis.

Many men have been heard to express strong convictions regarding what they believe to be the errors of psycho-analytical theory and the failure of psycho-analytical practice; but as Freud himself says:

> "No one has a right to convictions on these matters who has not worked at the subject for many years, as I have, and has not himself experienced the same new and astonishing discoveries." "If owing to ignorance of the subject you are not in a position to adjudicate, then you should neither believe nor reject."[2]

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II.—THE MAKING OF A NEUROTIC.

BY

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WE shall discuss this subject of "The making of a neurotic" in three phases:

1. The formation of the morbid complex.
2. The conflict of complexes.
3. The emergence of the symptom.

The Formation of the Morbid Complex.

The psychoneurotic symptom, like every form of animal behaviour, normal and abnormal, is ultimately the result of two factors, the hereditary and the environmental, and of these the determining factor is the environmental. Modern methods of investigation go to show that we do not *inherit* psychoneurotic symptoms, but that these can always be traced back to environmental influences during the lifetime of the individual. Before the early years of life could be investigated by hypnotic and analytic methods it was quite natural to assume that all neuroses which had existed from earliest childhood were due to hereditary or congenital causes. If a patient said that he had had his symptom "all his life," or "as long as he could remember," it was considered sufficient to assume that he was born with it. But many things happen in the first three or four years of life which a patient does not remember, but which have an important influence on his life and conduct. Now that those early years of life have been explored and laid bare by hypnotic and analytic methods it has been found that many conditions—neurotic headaches, bad temper, cynicism, alcoholism, homosexuality—formerly assumed to be congenital, are really due to abnormal environmental conditions of early childhood. It is true that many characteristics, normal or morbid, may be *transmitted* from father to son, but where such transmission takes place it is found to be not by way of inheritance, but by means of suggestion, sympathy, and imitation. The same law seems to operate in the psychoneuroses as in a disease like tuberculosis—one may inherit a predisposition, one cannot inherit the disease. Let us take an illustration.

A man has a tremor of the hand, which dates back "as far as he can remember"; indeed, his father had it before him, and the condition was put down to some inherited condition of the nervous system. On reductive analysis it was found to have originated when as a child of 3 years he was badly injured in the foot and was held down by his father while the doctor probed his wound. The trembling of his father's hand transferred itself to the son's and was associated with this painful emotional experience. This condition, like many another which was presumably inherited, was found to be due to a complex formed during the life of the individual, and was consequently cured.

As we should never diagnose hysteria until we have excluded organic disease, so we should never assume hereditary or congenital causes until we have excluded the environmental origin.

The psychoneuroses are thus to be clearly distinguished from "mental deficiency," which is commonly congenital or hereditary, and in any case is the direct result of a physiological deficiency of nervous structure. The psychoneuroses are psychogenic, and originate in abnormal psychological experiences during the life of the individual. It is true that in practice one meets with many neurotics who are also mentally deficient, inasmuch as they have inherited some physiological abnormality whether cortical or endocrine. (Indeed it is reasonable to assume, though I am unaware as to whether it is the fact, that such defectives are more liable to suffer from the psychoneuroses than others.) But this is not necessarily the case, for there are undoubtedly many patients suffering from the psychoneuroses who have not the slightest trace of mental deficiency, nor any trace of the stigmata of degeneration, but whose psychology is nevertheless distorted and gives rise to morbid symptoms.

Nevertheless, in the psychoneuroses hereditary factors do play an important part. Although we do not inherit a neurosis, we may inherit what is commonly called a "*nervous temperament*," or a "highly strung disposition," which is probably dependent upon a physiological condition of the synapses, of the endocrines, or perhaps of both. But a highly strung temperament is not a disease; everything depends on what we make of it. Thus in one family in which both parts are of a nervous temperament you may find one son an artist, one a poet—who commits suicide—one an alcoholic, and one a great preacher. The highly strung person is more sensitive than others to the pains and responsibilities of life, but he is also more sensitive to its joys and beauties. Besides this physiological factor of the nervous temperament we have the psychological factor—namely, *the instincts*, and it is these which play such an important part in the formation of complexes and therefore of the psychoneuroses. McDougall has emphasized that every child is born endowed with a number of instincts, each of which is charged with emotional tone—fear, anger, sex, maternal, submission, self-assertion, curiosity, self-display, and others. Shand has shown that when emotional tendencies are brought into touch with environmental conditions they tend to become attached to the objects which arouse them. These two factors combine to form mental experiences which

are retained in the mind as *psychological constellations*. Each constellation therefore consists of a nucleus from the environment—whether a person, event, or idea—round which are grouped or constellated the instinctive emotions. For instance, the sentiment of patriotism is formed by the attachment of all our instinctive emotions of admiration, tenderness, fear, pugnacity, submission, and assertion to our country.

There are three forms of psychological constellations: sentiments, dispositions, and complexes, the last of which give rise to the psychoneuroses.

The *sentiments* are those constellations which are consciously acceptable to us, and with which we consciously identify ourselves, like patriotism, the mother sentiment, the religious sentiment, and the sentiment for others, or altruism. The most dominant of all our sentiments are what we call our aims or ideals, since they are capable of moving our will to endeavour.

Psychological dispositions are those constellations which are so accepted by us that their activities become spontaneous and automatic. We are said to be "disposed" to this idea or that, or to this or that person, when our instinctive emotions are attracted towards them; so we develop a kindly disposition, a stoical, cruel, cynical, or egotistic disposition. Together the various dispositions in us combine to form what we term our "disposition." Psychological dispositions are the main constituents of character and the source of most of the normal habits of everyday life.

Dispositions differ from the sentiments in that they are unconsciously accepted, their activities are spontaneous, so that to act in response to them is "second nature" to us. An Englishman does not need to *think* whether he choose to save himself or his child in a wreck—the decision is spontaneous; he has a disposition of honour. These psychological dispositions are to be distinguished from *physiological* dispositions, such as give rise to habits like swallowing, and from *psycho-physical* dispositions like the instincts, for they are formed of instincts attached to ideas or objects.

Our psychological dispositions, together with the sentiments—that is to say, all those constellations which are *acceptable* to the individual—are together combined and organized to form the "*organized self*." When we normally speak of our "self" we mean all those sentiments and dispositions of which we approve and with which we identify ourselves. The function or activity of the "organized self" is the *will*.

The *complexes*, like the sentiments and dispositions, are formed by the attachment of the instinctive emotions to objects or experiences presented by the environment. But because of their repugnant or painful nature they are rejected by the self as unacceptable. The thought of the war may be the nucleus of a sentiment to a man who was heavily decorated, a complex to a man courtmartialled for cowardice. Again, what at one age may be a mother sentiment may be a mother complex at a later age. Complexes are commonly named according to the dominant emotion contained in them, like a "fear complex," "sex complex," "inferiority complex," or at other times by the name of the nucleus round which the emotions are grouped—a "mother complex," or "war complex," or "religious complex."

Complexes may be consciously recognized. Acts of cowardice, humiliation, or a sex trauma may be remembered only too well in spite of our endeavour to forget all about them. But many complexes are unrecognized. As we may dissociate ourselves from friends who have insulted us, or refuse to associate or identify ourselves with those who have disgraced our family, so we may "cut" and refuse to recognize or identify ourselves with complexes which are repugnant; they then become dissociated, split off, forgotten, until we become quite unaware of their existence. This process of dissociation being an active one, the term "repression" is found to be the more appropriate to describe it.

Sometimes all that is recognized of a complex is the nucleus or some accidental element in it. This is the case where there is a functional paralysis or a fixed idea which emanates from an emotional complex, but in which only the idea or physical symptom emerges while the emotion associated with it remains repressed. At other times it is the emotional element which is recognized, while the nucleus remains unrecognized. This is so in "anxiety" states, in which there is a fear, but the object of the fear is unrecognized. When the complexes are recognized and are consciously inhibited from expression in conduct we call it *restraint*; when the process of inhibition is unconscious we call it *repression*. It is important to recognize this distinction.

The dispositions and complexes are the sources of all our psychological "habits" normal and abnormal, the dispositions giving rise to what we term "good habits," like that of cleanliness, and the complexes "bad habits," like tippling or the neuroses. Complexes may thus be recognized or unrecognized, consciously restrained or unconsciously repressed. The former, the recognized complex, may affect our character and happiness; the latter, the repressed complexes, are alone capable of producing a psychoneurosis. The activity or function of the organized self we call the will; the manifestation and activity of the complexes we call impulses.

There is thus formed an antagonism in the mind between the will and impulses, between the "self" and the complexes, for their aims and ends are antagonistic to one another. As long as this antagonism remains, there is unhappiness and there may be neurosis. But complexes may be antagonistic not only to the organized self as a whole but to one another, for the ends of each complex are different from and often opposed to one another. Thus the fantasy of being a hero conflicts with a fear complex; self-display or exhibitionism with a localized adult form of sexuality.

Thus there are two forms of conflict—that between the self on the one side and the complexes on the other, and a conflict "in the unconscious" between repressed complexes. We shall later observe that a psychoneurotic symptom does not arise from one repressed complex, but from a conflict between repressed complexes. We shall also have reason to observe that the symptom serves the purpose of satisfying both sides of the conflict by giving expression to both complexes, and not merely to one complex.

Of all complexes none are more important than those which are concerned with the self—the fantasies of oneself which develop in early life. It has long been maintained by psychophysicians that the psychoneuroses originate in the first five years of life by trauma, suggestions, imitation, the atmosphere in which we are brought up, or other influences. I am inclined from personal experience to limit the time still further, and to say that all neuroses develop in the third or fourth year of life. For it is in the third or fourth year that every child develops self-consciousness—that is to say, gets its first impression of itself; and this impression, false or true, fantastic or real, is destined to remain with him and affect his whole life and character thereafter. The fantasies a child develops about itself from suggestions of its environment are of infinitely greater importance than any traumatic "shock." If a child is excessively admired it develops a fantasy of self-display, such as this fantasy from an artist: "There is nothing on God's earth perfect but me." A child pampered and spoilt, having everyone—mother, nurse, aunt—at its disposal to do its bidding, develops a fantasy of self-importance and omnipotence; another, neglected, kicked, and bullied, develops a fantasy of inferiority and self-depreciation; another has the fantasy of moral snobbishness, and in later life becomes a censor of others; one a fantasy of infallibility, and in after-life "can't do wrong," but blames others for its faults; another of omniscience, and becomes dogmatic; another is "perfect," and therefore intolerant of criticism.

It is true, indeed it is in the nature of the case, that such fantasies are unrecognized and are formed into repressed complexes. Our conscious conception of ourselves is often the opposite of our unconscious fantasy.

I once asked a distinguished artist if he had a fantasy of self-importance. "Not at all," he said; "I think much less of myself *than I really am*." The business man of 50 who comes with a breakdown, with the sense of failure and lack of confidence, is commonly a man with an extravagant power psychology, although he may consciously conceive himself as the world's greatest failure. Our conscious conception of ourselves is often the opposite of our unconscious fantasy of ourselves. A golfer remarked, "I have played golf for forty years and have never been on my game yet." He had an unconscious fantasy of what "his game" was.

Of all complexes those which are formed as fantasies round the idea of ourselves are the most potent. Indeed, I am inclined to think that they are the only ones that matter. In other words, it may be said that egoism lies at the base of every neurosis as long as we use the term

"egoism" to include not only self-love, self-esteem, self-importance, self-display, and self-righteousness, but also self-depreciation and fantasies of inferiority.

It is not difficult to see how such fantasies produce a nervous breakdown. If a man sets out to conquer the world and conquers only one hemisphere he feels a perfect dud. He is a failure in that he has failed to reach the impossible.

Yet such a fantasy as that I have just mentioned cannot itself produce a nervous breakdown.

The Conflict of Complexes.

Every psychoneurosis is the result of a conflict between *two* repressed complexes. I have often heard a patient's psychology described thus: "He has a sex complex," or "He has an inferiority complex." It cannot be too strongly emphasized that for the formation of a neurosis two complexes are necessary.

Exhibitionism is the repressed instinct of self-display. If this tendency is exaggerated by circumstances it affects the character but does not cause neurosis; if it is exaggeratedly developed and then rudely repressed, as by a severe punishment, there are formed two complexes, which conflicting form a neurosis. It is true that the man who sets out to conquer the universe breaks down, but why did he want to conquer the universe? This excessive and exaggerated fantasy was developed as an overcompensation for a feeling of inferiority. He was coddled because he was physically weak and developed a feeling of inferiority from which he was ever trying to escape.

If every neurosis is caused by the conflict of two repressed and antagonistic complexes it is of the utmost importance to discover *both* complexes. In the last case mentioned we need to analyse out not only the circumstances which gave rise to the fantasy of superiority but also that of inferiority. A psychoneurosis is never due merely to a repressed sexual desire, a repressed fear, or feeling of inferiority: it is due to a conflict between each of these complexes and another complex, such as a moral snobbishness, an extravagant sense of duty, or a fantasy of self-importance. Shyness, for instance, is never merely the expression of a sense of inferiority; shyness is the result of a conflict between the sense of inferiority and of superiority. We are never shy unless we are conceited; it is because we are not taken for what we think we imagine we are worth that we feel so shy and inferior.

It is for this reason that it is so frequently the youngest child who develops a neurosis. It is often said that the only child develops neuroses more than others. That is not my experience. I have very few only children to treat. The reason seems clear: the only child is usually brought up in a consistent atmosphere, frequently that of considering itself to be God, and develops fantasies of omnipotence, omniscience, and moral perfection. Such a child is excessively conceited in after-life, but does not often have nervous disorders. On the other hand, a child consistently brought up to regard itself as inferior grows up quite prepared to take a back seat in life. In neither is there an endopsychic conflict. But the youngest child develops two conceptions of himself—for instance, if a child is made to believe itself a prince by its fond parents and a worm by its jealous brothers. Or at one time of life, say for the first three years, it is given its own way and develops the fantasy of omnipotence, and at the next phase, perhaps owing to the death of an overdevoted mother, is excessively suppressed by a godmother or nurse—under such conditions a conflict ensues between the two fantasies, both of which have now become repressed complexes. The individual does not know if it is a god or a worm, and when the moment of decision arrives—on the battlefield, in marriage, or on the Stock Exchange—the patient tries to be both and breaks down.

Each complex is formed as a result of factors of which the environmental is the more important, but the neurosis itself results from an endopsychic conflict between repressed complexes. We can never account adequately for the nervous breakdown, nor can we treat it adequately until we recognize and analyse out both elements in the conflict.

We frankly approach this subject from the psychological point of view. The attitude of the psychologist differs radically from that of the biologist. The biologist looks at life from the point of view of adaptation to environment. The psychologist interprets everything from the point of view of mental processes and is interested in the events of the objective world only in so far as they give rise to mental processes. The psychologist and the biologist are not in any way antagonistic, but they look at life from different angles. This difference of attitude is of the greatest importance, not only in the conception of the psychoneuroses, but particularly in their treatment.

It used to be thought that a nervous "breakdown" could be caused by an objective experience, like a "shock," a fright, a sexual trauma, a disappointment, a failure. Man's main function in life, it was said, was to adapt himself to his environment, and a nervous breakdown was said to be due to man's failure to adapt himself to his environment. The soldier, it seemed quite obvious, breaks down because he cannot adjust himself to the strain and stress of war, and the girl to the shock of the sex trauma, the business man to his failure in business. This is all perfectly true from the biologist's point of view, but not from the point of view of the psychologist, and it is an inadequate conception from the point of view of treatment. If a soldier's breakdown were merely due to his failure to adapt himself to his environment he could easily overcome the difficulty by running away to safety. Why does he not do so? Because there is something within him preventing his doing so; he fears being a coward more than he fears the shell fire. In other words, a man's nervous breakdown is not due to the failure to adapt himself to his environment, but his failure to adapt himself to himself. The real conflict, a conflict more important than that between himself and his environment, is that between his courage on the one hand and his fear and desire for self-preservation on the other. It is quite true that the shell fire is the exciting cause, but it is effective only in relation to what it excites—namely, fear—and gives rise to a mental conflict. He has failed to accommodate himself to those latent forces of fear which his courage and sense of duty refuse to recognize. Running away is no solution to such a problem, whereas it would be if it were merely a matter of adaptation to environment. He therefore has to resort to a nervous breakdown to deliver him from the conflict.

The "shocks" which produce the psychoneuroses are always shocks we give ourselves. Stated in terms of psychotherapy, the psychoneurotic symptom is always the result of an endopsychic conflict.

This psychological approach to the neuroses is of the utmost importance in treatment; our problem is not primarily to fit a man to face his environment, but by discovering both elements in the conflict to fit him to face himself. For a man is impotent to face the onslaughts of the objective world until he has restored peace in the borders of his own soul; only when he has resolved these conflicts in his soul is he fitted to face his environment. He is then capable of facing the most terrible experiences, as has been proved by the many thousands of men who have braved the Arctic snows and stood the storm of shell fire with steadfast courage. Such adverse circumstances alone may break a man's physical strength, but cannot produce a nervous breakdown. With peace of mind a man appears to be able to stand anything; without it he cannot stand the strain and responsibility of writing a letter. As long as we approach the matter from the purely biological point of view we shall continue to treat the neurotic patient by changing his environment—sending him for a sea voyage, and so on. But he flies from his sickness in vain, since he carries his fever with him. The psychologist deals with the situation more adequately by dealing with the mental conflict which makes it impossible for the patient to face his environment.

The Emergence of the Symptom.

When there is a mental conflict between two repressed complexes, the tension is relieved by the formation of a symptom which satisfies both. The purpose of every psychoneurotic symptom is to satisfy not one but both complexes. It is true that the "shell shock" man satisfies his fear complex by getting paralysed, for this gets him out of the trenches as effectively as running away; but by it he also satisfies his exaggerated sense of duty which says, "a soldier never feels fear." It is not the man who admits fear, but the man who refuses to admit it who breaks down. The hysteric's pain in the back satisfies not only her craving for sympathy, but gratifies her fantasy of courage which represses it, and by which she receives the greater praise.

A man's observationism was traced to repressed sexual curiosity on his first night in the school dormitory. But by

what was it repressed? Not by a normal sense of decency, but by a moral snobbishness derived from identification of himself with the prince of prigs, Little Lord Fauntleroy. Both these elements had to be analysed and not merely the "shock" he felt.

This fact is sometimes expressed in the statement that "all neuroses are repressed desires." But we must recognize that they meet the desires of both conflicting complexes. It seems impossible that such a symptom as the fear of madness should be in any way "desired." Yet, to take one case, when this idea of madness was analysed down even such a symptom was found to satisfy two complexes. It was found to originate in an incident of 5 years of age when the patient was rushing about her bedroom naked in a frenzy of exhibitionism, and trod on a needle and screamed; her nurse came in and said, "You must be mad to rush about naked." The unconscious inference was: "If that is madness, then madness for me!" The exhibitionism was thus repressed, but persisted in an unrecognized desire to be mad, so that she might give it expression with impunity. By being mad she could satisfy her exhibitionist tendencies and rush about naked. No wonder the idea of madness unconsciously attracted her. But the symptom not only satisfied her exhibitionism, it did so in a way that was gratifying to her moral sense, for, being mad, she was exonerated from all blame and excused for her behaviour. In consciousness this repressed desire manifested itself as a phobia. Such is the nature of all phobias: they are fears of unrecognized desires in ourselves.

The Choice of Symptom.

It is of course notorious that the symptoms of the neurotic are infinite in variety, but there is a certain reason in the apparent arbitrariness of choice.

(*a*) *Biological reaction* may determine the suggestion. The repressed craving for sympathy finds its most natural expression in pain or sickness which, above all things, invites the pity of others, or at least in self-pity.

Vomiting is associated with the instinct of repulsion and disgust. The arousal and the repression of this instinct for other causes than the taking of nauseous food produces the same physical reaction. Thus a man with chronic vomiting, unable to take even milk, found this means of giving expression to something he had done which he found revolting, and which was therefore repressed. The recollection, admission, and acceptance of the facts cured him.

(*b*) One cannot but be struck by the enormous number of neurotics whose symptoms started with some definite *organic disease*. This was brought forcibly to my mind during the war, when numbers of post-influenzal cases were sent in to the neurasthenic hospitals suffering from the "after-effects" of influenza, such as headaches, backache, fatigue, palpitation. With the exception of the heart symptom (tachycardia), I found that in almost all cases their symptoms were of a neurotic type curable by psychotherapy. It was usually found that they were cases in which the patient had undergone mental strain and conflict during the attack of influenza. For instance, one was put in what he called the "death ward" to die; several experienced air raids during their illness. When these were analysed out and the mental conflict made conscious, the symptoms of headache, backache, etc., disappeared.

Since then I have been very suspicious of the so-called "after-effects" of many medical and surgical conditions, and my suspicions have often been confirmed by successful treatment.

(*c*) The symptom often seems to be *accidental*, as in the case of the youth with the shaky hand. The accidental symptom is thrown into consciousness while the emotional complex is otherwise kept repressed. It is always found that there is some association between the complex and the symptom.

But whatever the symptom, it must always be one which produces a result desired by the repressed complex. This is more clearly seen in the occupational neuroses. It would be no use for a telephone girl to develop blindness as a means of escaping from a life she unconsciously loathes, but it is of great use for her to become deaf or for the cashier to get blindness or writers' cramp.

We may summarize the conclusions of this paper thus: Every psychoneurotic symptom is the result of endopsychic conflict between repressed complexes formed from environmental and hereditary factors during the lifetime of the individual.

III.—MENTAL STRESSES OF ADJUSTMENT IN WOMEN.

BY

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THE fact that mental disturbances of psychogenic origin are more frequent among women than men is always a matter of considerable interest. On the supposition that the statistics represent correctly the relative incidence of psychogenic insanity in the two sexes respectively, the inquiry suggests itself, What are the stresses peculiar to women? Without attempting an exhaustive answer, I would suggest one or two adjustments that are peculiarly difficult for women and that recur as sources of psychic disharmony with notable frequency in a great number of neurotic patients. The recognition of these particular stresses and of their significance as factors in psychic disturbances in women was gradually forced upon me on dealing with a series of adult patients, and also after observation of some girl children of varying ages. A great deal of younger material was studied in a non-professional capacity, and impressed one profoundly with the overwhelming importance of parental, familial, and pedagogic "setting" for the prophylaxis of psychopathological conditions—one had almost said, habits.

The earliest apparent difference affecting the two sexes which seems to me indicated both in psycho-analytic practice and in everyday life is the difference in the maternal attitude towards son and daughter. Parents do not even in 1922 value girl children as highly as boys, and this is largely due to the maternal attitude. Where families contain children of both sexes the girls almost invariably are aware of at least a relative disparagement that may cause any degree of feeling, from one of passive acquiescence, or of affectionate amusement, towards parents and brothers, to one of the bitterest resentment and jealousy. Western education, especially for girls, being built upon a strictly asexual convention, children do not understand the significance of the different estimation in which they are held until they have been profoundly affected and the girls usually embittered or discouraged by it. When some kind of an appreciation of sex values does dawn upon them they transfer childish jealousy and inferiority reactions to masculinity in general, while at the same time they secretly cherish a fairy prince or other fantasy that later usually—though not always—allows them to make the apparently impossible adjustment to actual marriage without too much difficulty. From these reactions, and from the much more repressive type of their upbringing, there results in girls an inferiority complex that may or may not be conscious or masked by a compensatory aggressiveness. In the writer's experience, mothers who profess themselves ardent "feminists" are equally guilty with ordinary women of this heterosexual preference for their boys. The situation is thus perpetuated from mother to children and forced by her upon the family, owing to her predominant position therein. Both sexes of course are affected by this maternal preference, but the daughters relatively much more profoundly, by reason of their longer and closer association with their mother.

In spite of this often unintentionally inculcated sense of inferiority, the exigencies of modern life demand, however, that girls shall be economically independent in competition with their contemporary males, and here there occurs a second difference between the sexes often provocative of stress to the girl. At the same time that they are expected to prepare for a career of some kind girls are also expected to acquire various domestic skills that demand at least some time and effort never demanded of the boy. This maintains or intensifies the earlier inferiority feeling by increasing the difficulties of competitive endeavour, or aggravates pre-existing resentment by affording it a seemingly rational basis. It is at this stage that resentment against the handicap of sex may be voiced as rebellion against the menstrual periods, the wearing of long hair, etc.

Throughout her education her femininity is actually a burden to the average girl, a drawback that must somehow be overcome and yet is to be exploited by other people whenever expediency demands. The strictly girlish virtues are always regarded as those of service and submission, of repression, not expression, of self; these have to be sufficiently developed, as well as an aggressiveness adequate to ensure successful economic competition with the male. Pride in girlhood and womanhood in itself as distinct from mere

frivolous coquetry or from pride in successful boyishness is the rarest feature in the upbringing of girls; it commands no economic return, and has therefore no practical value. Few girls to-day in any class but would be boys if they had the option; and whether this is based on an ultimate sex jealousy (Freud) or not, or is a reaction to the increasing economic pressure on women, it is a factor of real import for those concerned with the problems of psychic adjustments in women.

It is, moreover, just when she is reacting consciously and unconsciously to the full tide of her adolescence that the girl is also called upon to absorb herself in interests whose aim—the maintenance of herself in celibacy—is biologically her own defeat. For the average woman—and she alone concerns us—marriage and a career are self-contradictory propositions; she has therefore to contemplate life from two utterly different angles at once, and must learn to combine in practice the necessary elements of two careers without allowing either to interfere too seriously with the other. And the irony of circumstances has it that in her occupational work, with very few exceptions, the standard demanded of the woman is the man's standard. To achieve this standard, not to speak of outstripping it, the woman must always expend more effort than the man, for, as well as any other difficulty, she must always overcome at least the inertia of the interest she has suppressed. This division of interest with its inevitable associates, psychic conflict and weakening of motive, and its consequence, the need of increase of effort to reach the same standard of achievement, pursues the woman throughout her occupational career. Nor is the problem solved by those women who adopt one of the more definitely feminine careers such as domestic work, nursing, or teaching, which are more directly outlets, not so much substitutes, for their biological drives.

Under modern conditions these activities exploit, but rarely satisfy, the average woman. They offer, in exchange for her directly biologically motivated effort, a comparatively exiguous sum of money, and the bargain is considered to be adequate. Unfortunately, in these occupations the woman is of value and successful just in proportion as she identifies herself affectively with her work. Insecurity of tenure; the necessarily inadequate return for the quality of service rendered; the perpetual exasperation of repeatedly forming impermanent ties on the pattern of permanent ones; the defeat of always starting afresh from the same point and never completing an experience; of always being a means for others to attain a completeness of life for ever denied themselves—all these and other similar considerations render even the more strictly feminine careers, sooner or later, as provocative of inner disharmony for women as are the more masculine.

The price of economic success, celibacy, is sometimes frankly recognized and refused, many women taking up simpler, less remunerative work because they consider it as sufficing till they can achieve their real aim, marriage; but if after all marriage is not achieved, these women are doubly victims of their biological-economic conflict, being doomed to celibacy in spite of themselves, and to a permanent economic inferiority as well.

Of course, for many women any conscious or manifest conflict of their divided interests is deferred for a varying time till the emotional tension of adolescent fantasy, which has been transferred to occupational interests, gradually evaporates and the realization of the menopause becomes defined. The psychic effect of this third stress may become appreciable at any time from the age of 30 onwards, and is not a physiologically determined condition. It is now that the quality of the individual adjustment or sublimation is put to the test. If either is sufficient the menopause will be no obstacle—in the absence of other complicating factors—to continued mental stability. If, however, there has only been a derived or an enforced enthusiasm for occupational interests, borrowing its vitality on a temporary basis only, until brighter dreams should be realized, then with the fading of these comes the inevitable clash with reality. The menopause is the death of biological woman's main interest and pleasure; she has to see it approach, to meet it, in some sense, as an execution at an approximately definite date, and she has to survive it. This she can achieve in one of at least five ways: (*a*) Having made a suitable adjustment to reality earlier in life, she will quietly carry on; (*b*) she will adjust to reality before or at the menopause with more or less marked difficulty and completeness, finally making the corresponding renunciations and substitutions; (*c*) a certain minimum adjustment to reality will be maintained *pari passu* with a fantasy life, both kept in watertight compartments; (*d*) or fantasy may be reinforced to the extent of the denial of reality and become definitely psychotic; (*e*) or, as Freud suggests, there may be a regression to a pregenital—that is, anal-erotic—stage of the *libido*, producing the characteristic changes in the personality.

Except in the first instance, the psychic conflict attending climacteric adjustment is never negligible, and is usually more or less severe and prolonged. It is also an adjustment that most men escape, and constitutes a third stress peculiar to women. This stress, as I have indicated, is often felt considerably before the actual physiological onset of the climacteric, but the association is too direct to suggest any other classification. For many the idea of the menopause has something of the foretaste of death, of a prevision of personal dissolution, and demands an adjustment profoundly painful to the ego feeling, even for some married women, while for celibates it has the additional poignancy of depriving them for ever of an unopened chapter of life of which they feel themselves to have been cheated. Here, too, there is apparent again the sense of sex injustice against women, because sex experience without social or other consequences is always conceivably possible for celibate men, but not for women.

Again, modern cultural needs and standards also range themselves with her economic necessity against the fulfilment of woman's biological ends, increasing and complicating her conflicts both in celibate and in married life. Her own cultural needs as well as economic pressure help to forbid or defer marriage or to lower the birth rate. With the expansion of their cultural interests, women are becoming increasingly unwilling to be submerged for ten to fifteen years in the crushing drudgery of rearing a large family; yet instinctive needs cannot be entirely suppressed, so that many women are doomed to be at war with themselves to some extent, however they are situated. For the married as for the celibate it is a constant conflict, variously stressed, of economic pressure and cultural needs as against biological ends. And here again the heavier stress at least falls upon the woman, in so much as her more urgent reproductive instinct is also thwarted.

Women therefore are divided between their biological needs and economic necessity and also between the former and their cultural requirements. They are burdened as well with a sex inferiority implanted in them in the home, and thoroughly bitten in by the mordant of an education that tacitly implies women must be as nearly men as possible to be of any economic value, and few women in the twentieth century dare not have an economic value. Many women equal masculine achievement, but at a price that the majority of their sex can never pay. Racially these exceptional women are not significant, they are too infertile to affect the numbers of the average woman, who is the really important person—the mother who bequeaths both her biological drive and therefore also her problems of adjustment to the succeeding generation.

Modern social conditions are compelling women more and more to model themselves on men, which, except in rare cases, inevitably causes intrapsychic conflict and division of interest. This conflict is increased and complicated by the growing cultural needs and ideals of both sexes. The idea of masculine superiority is maintained largely by women by their preference for their sons, and is further strengthened by the standard of occupational and cultural achievement being as yet always the masculine one. It is impossible to despise what is one's avowed goal. The present prevalent ideal of life for both sexes and in all classes is in fact modelled on that of the active untrammelled male who is free to go his way, in full—but infertile—satisfaction, without giving hostages to fortune as he goes. So much so is this the case that there are already indications of an increasing intrasex conflict as between married and celibate in both sexes respectively. It is needless to restate the corresponding intrapsychic conflicts this evokes in the woman or to point out how directly it is related to the general social unrest and discontent.

Women are suffering from a growing deviation of interest from biological objectives forced upon them by the conditions of twentieth-century life. This seems to affect them more than it does men, probably because women's biological objectives are more intrinsically of the web and woof of their lives—that is, are reproductive and nurtural, not merely sexual, and constitute life itself, not merely incidents in that life. Successful sublimation of biological interests, therefore, is a much more difficult and far rarer thing in women than in men, largely because of the difference in type between male and female sexuality. This is probably the real reason why men still lead the world in science, art, literature, etc.;

women being always handicapped in the struggle for supreme success by their lack of singleness of purpose as compared with men, and this handicap is perhaps the guarantee for racial survival.

There can be no simple and universal solution of these women's problems, but their prevalence and complexity call for attention. Industrialism cannot just be wiped out; biological needs cannot be allowed to run riot; restraint, discipline, effort, must be encouraged in both sexes—civilization is based on these. Neither sex can have every advantage, but although the lesser adaptability of women seems inevitable, and even apparently biologically desirable, the recognition of the causes of this fact is absolutely essential in psychiatry and pedagogy, and ought to be known to the woman herself and should not be misunderstood as an inferiority. It seems to me that the only alternative solutions of the woman's question so called are either the abandonment of the present economic system or an adequate grasp of the question at issue by all concerned, with a view to a more rational training of the young in their ideas of sex values. It is not a matter of the relative superiority of either sex, but of self-knowledge and mutual respect for both.

The particular stresses discussed are of course merely indications of how women of to-day are affected by the unceasing conflict between sex and society on which civilization is precariously poised. But, such as they are, the type and the constant recurrence of these stresses afford food for thought if it is remembered that civilization after civilization has waxed to some such height of female emancipation as we enjoy to-day and then collapsed. No one, of course, and certainly no woman, would venture to say the decline was always *propter* rather than *post hoc*, but the chronological relationship remains and is significant. Any social system or standard of civilization that bears too hardly on the biological needs of either or both sexes is of course doomed. Indications such as I have sketched would suggest that women at least are in some ways overtaxed by our social system to-day and that once more it may be a question of civilization versus race. Although, however, so much of the solution of these difficulties must be sociological, their significance for the individual is of the highest interest to the psychiatrist, who, being cognizant at first hand of their prevalence and importance as morbid agents, must therefore play a large part in their elucidation and control.

IV.—THE PSYCHIC AND ENDOCRINE FACTORS IN FUNCTIONAL DISORDERS.

BY

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I MUST begin with a word of explanation about the phrase "functional disorders." I use it, not in a strictly scientific sense, but as the most convenient label for a group of conditions in which no structural alteration, appreciable by our present methods of investigation, has any etiological significance. The advance of science has already transferred a number of morbid conditions from the functional to the organic group. Only a few years ago, for instance, paralysis agitans was regarded as functional. To-day, it is generally attributed to a definite and localized degeneration.

I note that in another Section the subject of binocular vision is to be discussed. I might have given that phrase as an alternative title for my own paper. It is my object to stimulate you to "use your lazy eye"; whether the prism is needed on the right or the left is a matter for each one to settle for himself; but I venture to say of the profession in general that when we contemplate these functional conditions very few of us are without bias—be it towards the somatic or the psychic. And if we have a "lazy eye" we cannot have binocular vision; and where there is not binocular vision there cannot be a stereoscopic image. In the underworld of psycho-analysis the "complex" and the "complex-stimulator" are familiar phrases. There are some physicians to whom a psychic theory of a neurosis acts as a vigorous complex-stimulator, and there are physicians who have been analysed *à outrance*, who yet seem to have an unresolved complex about the influence of the organism on thought and behaviour. One would almost think, to hear the defensive fervour of some of these partisan scientists, that they have some personal stake in proving an exclusively organic or, it may be, an exclusively psychic etiology for a given clinical state.

Let us try, then, to approach the subject with that freedom from prejudice which is always preached by psycho-analysts and sometimes practised by scientists. But if we are to rid our minds of prejudice we must do what we can to free them of ignorance, and that means that we should study as we can the side we happen to know least about. Now this is not an easy task. On the psychic side the literature is vast. Psychotherapy seems to abolish literary inhibition on those of us who practise it. And the endocrinologists appear to be following this evil example. The reports of Vienna are well-nigh matched by the records of endocrine therapy claimed by New York; and plain doctors like ourselves find it hard to keep their sense of proportion. One would wish that our country could stand in this matter for that dispassionate spirit of compromise which is, at the same time, the scientific spirit of correlation.

But the scientific spirit finds itself confronted with serious difficulties on either hand. The psychic factor, despite the bold claims of the Freudians, eludes scientific treatment beyond a certain point. Nor is this due entirely to our present ignorance, for it will always elude such treatment. Life, ladies and gentlemen, is primarily an art; and the sooner the scientific psychologist recognizes his limitations the less likely will he be to expose himself to criticism. Freud may be, and I believe is, fundamentally correct; Jung may illumine us still further; but the last word will always come from a Robert Louis Stevenson.

And on the endocrine side, what do we find? Certain very exact data about the production of rickets in guinea-pigs, a good deal of well-attested information on the mental results of thyroid feeding in cretins, and beyond that a mass of probabilities and possibilities. We cannot complain of this. It is largely inherent in the nature of the subject, for up till now the methods of exact science have been not a little baffled in the search after endocrine truth. The *x* rays have enabled us to gauge with some show of objective accuracy the size of the pituitary; the estimate of the basal metabolic rate bears a striking correlation to thyroid activity; and the results of surgical interference with gonads or thyroid can be noted. But even this last method is shorn of its exactitude when we consider that the removal of a portion of thyroid may or may not implicate some of the parathyroid bodies, and, seeing that we are not even positive as to the number of these bodies, the validity of our conclusions is still further compromised.

From all this it must be evident that we are groping in a sphere where facts are peculiarly elusive, where opinions are necessarily conflicting, where speculation is justifiable and empiricism imperative. And even in our empiricism we are hampered, for the simple reason that we are in the hands of the commercial drug houses. I took the trouble not long ago to inquire of several well-known firms whether their respective preparations of thyroid contained or did not contain the parathyroid constituent. The replies were depressing. A firm whose accuracy I have reason to trust explained that owing to the variation in the position of the parathyroid there was always liable to be a slight amount present in thyroid preparations. They had only succeeded in isolating parathyroid in very small quantities and at great expense.

Another firm confessed to the same uncertainty, and expressed scepticism as to the possibility of detecting and separating the parathyroid from the thyroid. A well-known American firm reported that they had only found one man in the United States who was able to locate the parathyroid and extract it for use. The accumulation of detailed evidence in this direction made one inclined to discount as mere commercial rhetoric the unqualified statements of other firms that their thyroid or parathyroid tablets were prepared in each case from the gland, the whole gland, and nothing but the gland.

Thus our clinical empiricism is hampered by potential fallacy at the very outset, for it is obvious that when our clinical results from the use of a certain hormone contradict those obtained by others there may be a possible explanation in the relative value of the preparations used.

These considerations, and others that I have not mentioned, make it specially difficult to formulate definite and demonstrable views on this subject. But apart from the strictly scientific study of these problems, there is a mass of facts supported by universal human experience that we cannot afford to ignore. First of all, there is the correlation between physiognomy and mentality—a correlation which provides the cartoonist with a language of his own. Let us suppose that in a play a somewhat invertebrate curate and an American "captain of industry" appear; what would we say

if the first were broad-shouldered, square-jawed, with black hair and deep-set eyes, while the latter appeared slender, fair, chinless, and frog-eyed? We would protest at the incongruity; and in our protest we would implicitly admit that the adrenal type of humanity is rarely submissive or effeminate, and the thymocentric is never endowed with initiative, determination, and perseverance.

But long before there were captains of industry or pale young curates mankind had practised on a large scale an experiment in the influence of the gonads on the mentality of the horse. Admittedly the operation of castration alters the behaviour-reactions of the horse very greatly. The psychology of the stallion is a totally different thing from that of the gelding. Man castrates the horse to promote his docility in the presence of such stimuli as steam rollers, field artillery, and fillies. He knows that the withdrawal of the gonad hormone constitutes a condition that transforms the reflex of behaviour. Man has known all this for centuries about the horse; it is only dawning on him to-day that the analogy holds in his own case.

We see two boys, sons of the same parents, brought up in the same environment. The one is tough, daring, high-spirited, and early develops a proclivity for the society of the opposite sex. The other is flabby, lethargic, pusillanimous, and morbidly shy in the presence of women. We ponder on the contrast, and it never occurs to us that a clue might be found in that attack of mumps that the second boy had, when he was 12, with a few days' orchitis that was soon forgotten. In other words, the unknown virus of parotitis infectiva, with its specific selection of gonad tissue, is the counterpart of the veterinary surgeon's knife. But when we have described these two types, and correlated them with an important endocrine contrast, we have not said the last word. There are certain moral qualities that may yet transcend the trend of behaviour: the first, full of animal courage, may be a moral coward and make shipwreck of his life; the second may be a moral hero, and overcome his numerous limitations and make good in the completest sense of the word. In short, the endocrine balance in man may condition, but it does not determine behaviour.

Take another example. McCarrison, in his great book on the thyroid, has shown that in the causation of exophthalmic goitre three factors play a part—the nutritional, the toxic, and the psychic. How many cases of exophthalmic goitre to-day are being treated from these different standpoints? I venture to think, very few. One falls into the hands of the organic scientist, who treats the patient by organic methods, and for the rest bids her to cease from worrying. Another falls into the hands of the psycho-analyst—the kind that wears blinkers—and he proceeds *secundum artem* to lay bare a mother-fixation, while he ignores the physical factors entirely. Nevertheless, it must be obvious to all open-minded observers that both lines of treatment are called for, not necessarily concurrently, but each in its place.

An example such as this throws light on an old shibboleth —"What mind can cause, mind can cure." At one time I firmly believed in that generalization; now I make my reservations. I believe that the emotional shock which so frequently precipitates the attack of exophthalmic goitre constitutes only one condition of the onset, the other being of a physical character. That shock sets in motion a chain of physiological disturbance which cannot be redressed merely by the adjustment of emotional disequilibrium, though it may well be true that the physiological disturbance can never be completely set right until the emotional factor has been successfully dealt with. We should therefore make a point, in dealing with all functional conditions, of assessing to the best of our ability three factors:

1. *Inherited endocrine pattern.* This involves some investigation of the patient's family history, not only from the psychic point of view, but also from the physical. "My father was a musician. He was a very tall striking person." This would suggest the pituitary heredity from both mental and physical evidence. "My mother was dark and thin, and was a martyr to asthma" would similarly suggest an adrenal overemphasis on the maternal side. The more we know the more numerous are the sources from which we can draw information of a potentially fruitful order.

2. *Personal endocrine history.* In general we want to know how the endocrine system has reacted to the physiological crises of puberty, marriage, pregnancy, etc., and also how it may have been influenced by pathological factors. For instance, a late puberty may confirm the impression that we are dealing with a thymocentric type; the beneficial effects of pregnancy may suggest a hyperthyroidic woman; and so on. But much more important as a rule is the history of disease; the chronic colds and sore throats with several attacks of tonsillitis that culminated in a belated enucleation of tonsils and removal of adenoids; then the laryngologist's comforting assurance, "Now the patient will feel better than he has ever felt." How often does a laryngologist in such circumstances stop to think of the once efficient thyroid now morphologically altered beyond repair, that will never again do a full day's work? Or the case of chronic constipation with its disastrous adrenal implications—how often does the cure of the symptom leave behind an irremediable hypoadrenia and a vagotonia that will influence mind and body alike till death?

3. *The patient's emotional development.* This—the psychic—side of the picture is to me neither more nor less important than the somatic. We can only reach a just estimate of the etiological factors if we inquire into both sides of the picture with some minuteness. Prejudice—native and acquired—generally prompts a disproportionate interest in the one side and a corresponding lack or absence of interest in the other. This is the real secret of our failure in handling functional cases. One man will hardly deign to count a pulse, while another fails to elicit the story of an unrequited love. For my own part I think there is little to choose in probable etiologic importance between a dental abscess and a stepmother. They both have a way of assuming pathogenic importance unobserved. The one eludes the dentist's observation, the other the patient's.

I have tried to show that the interdependence of endocrine and psychic factors in general confronts us at every turn. Let us now see whether any specific correlation between individual glands and mental characteristics can be traced. And here we pass still farther from the objective to the speculative.

Let us begin with the thyroid. Leonard Williams, more than anyone else, I think, has emphasized the feminine function of this gland. As it is the great gland of anabolism, so it must be of greater significance to the female on whom katabolic demands are so unequal and at times so excessive. But I think there is a broader view possible. I would submit that the thyroid is the gland of creation. Its importance from the procreative point of view is commensurate with the respective shares of the male and female in reproduction. But in the wider sense of creation, as artistic creation, the thyroid still seems the dominant factor. Surely we will all admit that the creative artist who becomes subthyroidic ceases to create? Some years ago, in a paper on a kindred subject, I asked if anyone had ever heard of a myxoedematous artist. The only reply came from Dr. Tredgold, who cited the case of a cretin who had lived in Zürich in the eighteenth century, and was an artist of some repute. Once more I ask for cases of subthyroidic creators—be it of works of art or of children. True, the subthyroidic woman is not necessarily sterile, but I notice among my gynaecological friends a tendency to prescribe thyroid extract as a routine treatment for sterility. Again, I would have you observe the mutual exclusiveness of child-bearing and artistic creation. Had I time I could cite several cases that in my opinion go a long way to show that the woman of artistic ability ceases to create works of art, largely or altogether, as soon as she is taken up with the maternal function—and this not for any superficial reason of time and opportunity, but because her storehouse of creative energy is unable to cope with both kinds of creation. The psychotherapeutist is frequently called upon to cope with the artist whose capacity for expression has deserted him or her. In such cases I believe we should always study very carefully the state of the thyroid function, in addition to the emotional factors. These latter appear to me frequently to be secondary to the failure of self-expression, rather than primary and causative.

If we now turn to the pituitary, we are at once confronted by the enigma of its own paradox. The mutually inhibiting actions of thyroid and parathyroid, or adrenal cortex and adrenal medulla, are relatively simple problems as compared with those of the anterior and post pituitaries. Berman makes the ingenious suggestion (only he does not enunciate it merely as a suggestion) that the postpituitary is responsible for differentiation of sexual types. Postpituitary failure, therefore, makes for hermaphroditism. In either sex specific sexual characteristics are less differentiated. Of the anterior pituitary it is more or less established that failure in the male is an essential condition, if not the sole cause, of Fröhlich's syndrome. Now the psychic mould of a case

of Fröhlich's syndrome is full of interest, and, if I may judge from my slight experience, fairly constant. We have a large fat man, morbidly juvenile in appearance, with undersized genitalia, and little or no sexual desire. He has a strong sense of inferiority from his "deprivation complex," with the compensatory self-assertion that goes with that inferiority. On the other hand, the man with a well-developed anterior pituitary tends to be tall, spare, and normal in sexual characteristics. But the psychic correlative of well-developed masculinity is power, and some element of power in character make-up is undoubtedly attributable to the pituitary factor. There is another psychic factor that we have good grounds for associating with this gland, and that is imagination.

Now the adrenals are also sources of power, in that they control the sympathetic system, and thereby dominate the fight and flight reactions. But the power quality of the adrenal-centred type is of the objective order and depends on immediate stimulation. I therefore venture to suggest that the power coefficient of any given individual is made up of the combined pituitary and adrenal hormones and varies in type according to which of these two hormones predominates. Thus the pituitary-centred provides the type with the power fantasy, while the adrenal-centred provides that with the power energy. Our Napoleons, Bottomleys, and Northcliffes are presumably pituitary-centred, while the classical type of British naval officer can confidently be classed as adrenal-centred.

I have now suggested a speculative and rough classification of these three hormones—thyroid for creation, pituitary for subjective power, and adrenal for objective power. I have not done so with any particular desire to convince you of my views. My intention has rather been to show you how some such hypothesis can be usefully associated with our psychological conceptions.

It has long seemed to me that the Freudian theory suffers from an ambiguity at the outset in its presentation of the human dynamic. The *libido* is referred to as if it were homogeneous. This is only so far as I understand the Freudian theory of to-day. One criticizes with diffidence, as the stock reply of Freudians to their critics is to point out that the critic's comprehension is limited or his information out of date. It seems to me that Adler's contribution on power psychology needs re-emphasis. I would submit that the personal dynamic of any human being consists of three main urges: (*a*) the creative urge, (*b*) the ideal-power urge, (*c*) the real-power urge—the three corresponding to the three hormones previously referred to.

Now from these three main urges we can build the scaffolding at any rate of a sex psychology. Motherhood is not likely to act as a strong incentive to the non-creative woman. The marital state cannot be expected to attract a woman with a strong power fantasy, in that the condition of self-surrender is implicit. Nor can it attract the man who is predominantly artistic or creative, and exceptionally ill equipped on the power side; for the man with a submissive psychology makes a useless husband outside musical comedy.

Regarded from this point of view the problem of homosexuality becomes to some extent simplified. We are told by the Freudians that the average adult is only a man or a woman to the extent of 75 per cent.; the rest is called a homosexual component. Supposing this observation to be correct, could we not restate it thus: The complete man is power-inspired, with a very small residue of creative impulse; the average man has a weaker power urge and a somewhat stronger creative impulse. The complete woman is all creative with none of the power factor that obstructs submission. Perhaps it is fortunate for society that these extreme types are not more common.

Now, if we take a family in which the emotional background is such as to favour the production of a homosexual son—the mother fixation, the father fear, and so on—we are justified in surmising that the sons with the strongest power psychology will win through to a normal adult orientation, while the one with the largest creative component will succumb to the warping emotional forces, and end up as the homosexual. *Per contra*, the daughter with the strongest power psychology will fail to make her adjustment to the potential mate, simply because the conception of surrender has become impossible to her, in the atmosphere created by a bullying father. We see, therefore, that the endocrine pattern of the child has a good deal to say to the developmental reactions of the adolescent and the ultimate sex orientation of the adult.

As an illustration I quote the following case:

A girl of 14½, who was alleged to be unmanageable both at home and at school, untruthful, and given to petty acts of theft. On the psychological side we had a complete rebel and exhibitionist psychology, with a power urge that seemed incapable of sublimation. Her father was a cunning tyrant and a cowardly bully. He had divorced her mother. She hated her father personally, and her school teachers *ex officio*. She derived the greatest pleasure of her life from outwitting them. She was slack and careless in games as in everything else, though she had mental ability above the average. She would secretly pawn an article of clothing, and then, for want of a better way of spending the proceeds, would take a taxi from school to her home. She was an inveterate sensation-monger, and preferred to be the centre of a dramatic school upheaval than to be ignored as a mediocrity. She was alleged to be devoted to pets, but when she had pets she was found to be secretly cruel to them, and on occasions would even kill them off, and then affect regret. Thus the outline of the psychological picture was fairly complete.

Now let us turn to the physical side. She was very powerfully built, and had precocious sexual development. She was not unshapely in the sense that the subthyroidic is unshapely. She had a slow pulse. She was troubled with enuresis diurna, which was of course put down to "naughtiness," "mere carelessness," etc. I believe this patient belonged to a type that provides many young delinquent girls. The thyroid function was manifestly subnormal. I imagine that the pituitary was overactive. Thus we had a notable absence of the maternal urge of the normal adolescent girl, depending on her deficient creative impulse. Hence the instinct to protect helpless creatures, which is normally the basis of a girl's interest in pets, gave way to a sadistic tendency. The pituitary overaction caused her to live in a fantasy world of power, a world in which she performed wild tomboy feats of the most extravagant description. It caused her to plot and contrive schemes whereby she would make her elders dance to the tune she piped. Finally, it may reasonably be supposed that some connexion existed between the pituitary condition and the enuresis. At the same time it must be remembered that on the adrenal side she was obviously defective. All the objective energy of the really fighting rebel was notably absent. Her endurance was from every point of view below par, and she was only saved by her pituitary from a vagotonic state of inertia.

Now the picture I have tried to fill in is one of essential and perhaps lifelong conflict. It is the picture of an adolescent whose endocrine equipment does not lead to mating or parenthood. No girl with a subjective power urge of such dimensions can contemplate the rôle of the wife with contentment, nor can one so devoid of creative potentiality feel any attraction in the possibility of motherhood. Hence repressions of the most devastating kind begin to occur at an early age; for repression is the natural method of reconciling elements that are irreconcilable in consciousness. Our instinctive equipment is based upon our endocrine pattern. When it can be reconciled with our destiny things tend to go well with us. If it is irreconcilable with our destiny, complexes inevitably result. And our biological destiny, whatever may be our ultimate fate, is parenthood. To say that many women are perfectly happy as spinsters, and that many men prefer to be celibates, is in general an admission of an endocrine failure which unfits them for parenthood. But whether or not the adjustment to celibacy be satisfactory only the analyst can tell; and for my part the more experience I have of analysis the more convinced I am that—welcome or unwelcome—our biological destiny haunts us from childhood to the climacteric.

The same correlation between endocrine make-up and psychological conflict is illustrated in a much commoner group of cases—the anxiety states. The war has made us all painfully familiar with these cases, but even in times of actual peace such as we had before 1914, and of nominal peace such as we have had since the armistice, they are very frequent. On the psychological side they consist in conflict which has resulted in complexes with a strong fear affect. I imagine that all fear can be traced back to one of two sources: either it is the fear of extinction, including all the religious fears of eternal punishment, or it is a mating fear—in the male the haunting fear of impotence (which is infinitely commoner than most of us believe), and in the female the fear of male aggression in the sexual act. From these two springs arise the protean phobias of the anxiety states, and in no department of functional disorder has analytical treatment more completely justified itself.

But what in general is the somatic side of the condition? Does it not correspond unmistakably with the condition known as sympatheticotonia—thin, tense, high complexion, overactive sweat function, irritable or irregular peristalsis, rapid pulse, and so on? In other words, we learn to correlate a fear complex with hyperadrenia, or a repressed fear with a constantly stimulated fight or flight mechanism. If this much be granted, it is obvious that the individual's endocrine

pattern must to a great extent condition the effects of a fear repression. The individual with a balanced adrenal function will be less likely than one of the opposite type to develop the typical anxiety neurosis. On the other hand, his repressed fear is more likely to manifest itself in hysterical defences. But once again I must emphasize the fact that the endocrine pattern only conditions and does not determine the ultimate reaction. We shall fall into serious error if we imagine that the endocrine factor is the final determinant of behaviour.

As a last illustration of the interdependence of the endocrine and emotional factors, I would mention dementia praecox; let us take the paranoid type in particular. On the psychic side we have a history, it may be, of a bright boy who has done well at school and begun to flag, perhaps, at about seventeen. (The cases in which an element of mental defect can be established need not be considered for the moment.) Then, as the adolescent faces manhood, he begins to regress, and the picture which Jung has given us is slowly elaborated. It is a picture of generalized retreat from the challenge of life; a regression from maturity to the cradle; an ever-increasing tendency to rationalize his failures into the inevitable outcome of circumstance and environment. And in every case, without exception, we can trace how life was presented as too exacting and too menacing, while the nirvana state of protection in a maternal environment became correspondingly too seductive.

And now turn to the other side of the picture. Mott has established a striking correlation between dementia praecox and aspermatogenesis. I do not suggest that this is the outcome of the emotional regression, but I do submit that it is reasonable to regard it as the conditioning factor. To argue the claims of the one theory against the other is to me utterly unscientific. If a motor car stops on a hill, it is useless to argue as to whether the hill is too steep or the engine too weak. The plain fact is that the engine is too weak for that particular hill. We know—at least analysts know—that in practically every case of dementia praecox life's challenge has been made steeper than it need be. It is not surprising, then, that the cases of failure are those with an inadequate biological dynamic. And in the male it is this inadequate dynamic, based upon a low endocrine efficiency, that produces that train of psychological retreats that we call dementia praecox. Once more we see the emotional conflict conditioned by the incompatibility between the individual's instinctive equipment and his destiny. To every case of dementia praecox his destiny has appeared unattainable, and the thought of that destiny—mainly biological, but social as well—has haunted him from reality into a state of ineffective fantasy.

In conclusion, allow me to say once again that this paper is frankly speculative and makes no claim to scientifically demonstrable accuracy. I make no apology for this, as I have already indicated the difficulties which at present stand in the way of a strictly scientific handling either of the psychic or of the endocrine side of the material with which we are dealing.

The immediate hope of progress in this field seems to me to depend on the advance of individual clinical observation of the apparent correlations between psychic and endocrine factors and the criticism and comparison of the hypothetical conclusions that can be drawn. In this work we may expect to be denied the consolation of obtaining scientifically demonstrable results; but we may at least aim at securing the first condition of accurate observation and true theory—namely, that freedom from bias which alone gives binocular vision.

V.—PSYCHOTHERAPY WITH SPECIAL REFERENCE TO AUTO-SUGGESTION.

BY

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PSYCHOTHERAPY, if it is to gain general recognition and wide adoption, must be based on a sound psychology. The differences of technique which are advocated by the pioneers in the various systems which are in vogue seem to suggest to some that there is no true science of the mind. While therefore we do well to practise those methods which commend themselves to us, and which have proved useful in our hands, and to advocate the same, yet we must seek to establish a common basis of psychology which must be the foundation of every system.

The late Dr. Rivers, in a lecture on "Mind and Medicine," has claimed that determinism in the psychical sphere is as important as in the physical sphere, and, without surrendering our belief in the agency of free-will, we shall all do well to follow this advice as a working hypothesis.

There are three great principles which seem to me to be common to all systems of psychotherapy however much they may vary in their application. They are as follows:

1. A recognition of the meaning and paramount influence of the unconscious mind in the human economy, using the term from the widest standpoint.

2. The adoption of certain methods through which the "unconscious" can be influenced.

3. The final application of these methods by the individual concerned.

These great principles govern the methods of auto-suggestion associated with the name of M. Coué, and I propose to indicate how these are carried out.

The Unconscious Mind.

1. The unconscious mind finds its counterpart in the system of Coué in the "imagination." It is obvious that this cannot be regarded as a complete definition of the term "the unconscious," but for practical purposes the expression is of great value in presenting to our patients the idea of "the unconscious" which it is important that they should realize. Imagination is used more in the sense of imaging than imagining, as this word commonly signifies, and it represents the view that every action, mental or physical, of the human personality is preceded by the image or picture of what is about to happen. The imagination of the artist or poet is an instance of this, which is in accordance with our common phraseology.

This imaging is something which is charged with force and consequently with emotion, so that it becomes irresistible. I have referred to this in a previous paper as "the vital force within us which never sleeps night or day, which is not only the source of our wide-awake thoughts, or of our nightly dreams, but which is the supreme controller of all our bodily functions." Interpreted in detail, this means that it is the same mind control which directs the action of the circulatory and digestive systems, which is responsible for what are usually spoken of as our voluntary movements, and, on the other hand, directs the processes of repair when any part of the human organism is deranged. It is the same mind control which is responsible for our thoughts and emotions, and this is the conception which we have of this use of the word "imagination."

This, as we have said, represents in some measure at least the idea of the "unconscious," and it is essential that we should understand that this great process is going on apart from consciousness and that we are only aware of the results of this imagination.

Another fundamental principle of this system of mind control is that, in its relation to our bodily functions at least, it is designed for the perfect adaptation of every part, and that it is only when this is deranged that irregularities occur. With this idea before us it is our great aim to secure that the imagination may carry out its great task unhindered either by past or present adverse influences.

Suggestion.

2. We now pass to consider one of the methods by which the "imagination" can be influenced whether for good or ill, and that is by suggestion, and particularly by that variety which we speak of as auto-suggestion. M. Coué illustrates this process by the common hypothesis that we have in effect two selves—a conscious self and an unconscious self. Of the latter we have already spoken, and it would almost appear as if there was no room left for any conscious direction. This is very far from being the case, and M. Coué describes his system as self-mastery by auto-suggestion.

The truth is that we have not only the power but the responsibility of controlling our personality. If, however, this is to be done the conscious must act through the unconscious by the process of auto-suggestion. This, however, must be practised with good judgement, for, as I often say to my patients, "Your imagination will not be bullied by me or even by you." This explains many of our past failures. We have tried to change our own habits and those of others by a *tour de force*, and the very violence of our efforts has produced the contrary effect. This phenomenon has been spoken of by Coué and Baudouin as the law of reversed effort,

and although this description has been criticized it has been of practical usefulness to many.

Auto-Suggestion.

3. If it is admitted that each individual must apply the psychological remedy to his own case, however much he may be helped by another to make his adjustment, this process becomes essentially one of auto-suggestion. In the system of Coué the greatest stress is laid upon this factor, and though there must be the element of suggestion in every case, yet each individual is shown that the power to obtain relief rests with him and him alone. I often say to my patients, "You are the master of your own ship."

Dr. Monier-Williams has established a small free clinic for testing Coué's system of collective auto-suggestion in which I am assisting him. In this clinic and in my ophthalmological practice, and also in the treatment of malarial and dysenteric pensioners, I am testing this technique of auto-suggestion, concerning which it is hoped later on to publish some of our results.

DISCUSSION.

Dr. R. G. GORDON (Bath) said there had not been much advance in psychotherapeutics during the last two years. Psychology and biology were not antagonistic, and all psychoneurosis was not due to sexual influences. The unit of any process corresponded to a reflex arc set in motion by a stimulus which might be a mental or biochemical change, and it was on these lines that psychopathology should be built up. Psychotherapeutists must work on a wide basis of physiology as a whole if progress was to be made.

Dr. MURRAY LYON (Edinburgh) said that hypnotism had been largely abandoned and suggestion was the main means of all treatment in one form or another: there was nothing new in what Coué said. Syphilitic neurotics were all potential tabetics or general paretics, but by suitable treatment the development of these diseases should be prevented. Insomnia, lightning pains, and ataxia of tabes had been controlled by suggestion.

Dr. CONNELL (Edinburgh) agreed with Dr. Hadfield that every symptom was due to endopsychic conflict—sexual instinct was almost invariably involved as one factor. The environmental factor was of great importance.

Dr. WILLIAM CALWELL (Belfast) objected to the age of 3 years as being that of the awakening of consciousness; this was a gradual process, a process of evolution, a gradual unfolding, not an isolated fact. He urged that pre-natal forces and those acting during the first two years must not be lost sight of. There was too much insulation by the psyche; psychology was the physiology of the higher centres, but the examination was held from a different aspect. Heredity was a much stronger force than Dr. Hadfield said; physical characters were inherited, and so were mannerisms and moral and unmoral tendencies. Dr. Crichton Miller's endocrine organ influence could be amplified; the tone of muscles had an effect on the mental attitude. Perhaps the stimulation of a cold bath and a rough towelling of the skin had more than a reflex action; perhaps it stimulated an internal secretion from those organs.

Dr. HELEN BOYLE (Brighton) thought Dr. Suttie had been unduly pessimistic about the outlook for women. Temperament played a very important part—"Give the child a start with no feeling of inferiority to her brothers, praise her for what she is good at, and she will do whatever she has to attempt well." Girls must know their limitation, whether submissive or aggressive; there was plenty of room in the world for all sorts.

Resolution by the Section.

The PRESIDENT (Professor George M. Robertson) moved the following motion, which was carried unanimously:

"The members of the Section of Neurology and Psychological Medicine of the British Medical Association are of opinion that instruction in psychology and psychopathology (medical psychology) should form part of the curriculum of all medical students, and further, that this opinion should be brought to the notice of the General Medical Council and all the teaching bodies in the United Kingdom and Ireland."

SECTION OF RADIOLOGY AND ELECTROLOGY.

LEONARD A. ROWDEN, M.B., C.M., President.

DISCUSSION ON THE THERAPEUTIC VALUE OF STATIC ELECTRICITY AND HIGH-FREQUENCY CURRENTS.

OPENING PAPERS.

I.—STATIC CURRENTS.

BY

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D.M.R. and E.Cantab.,

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THERAPEUTIC history is full of the stories of various agents which come heralded with much noise and advertisement, and have a sensational rocket-like rise; then suddenly their light goes out and they are forgotten. This cannot be said of static electricity. It has been described as Nature's safest and most rational remedy.

Discovered about 1672 by Otto von Guericke, it cannot for many years be traced; but in 1750 Jallabert, Professor in Experimental Philosophy in Geneva, published a book in twelve chapters, *Experimenta electrica usibus medicis applicata*, in which the successful treatment of diseases of the muscular and nervous systems by means of static electricity is described. Thus it was used as a therapeutic agent prior to 1750, and it has withstood the test of time since then.

The therapeutic advantages and the wide range of utility of static currents are now generally admitted by all those who have thoroughly examined their merits. This change is of comparatively modern date, having been brought about within the last twenty or twenty-five years, and is due chiefly to the work of the late Professor William James Morton and Dr. Snow in New York.

In order to have a clear conception of the therapeutic value of static electricity it is necessary to describe the different forms or modalities which are obtainable from the static machine. The word "modality" is disliked by several authorities; but I plead for its inclusion as being the one least open to objection.

Although one frequently has to do so owing to greater familiarity with the term, it is an anachronism to speak of static *currents*, for when a static charge becomes a current it is no longer static. Nearly twenty years ago I published in the *Lancet* a chart of static modalities, and though then, and since then, several objections have been taken to the word, no better has been suggested.

There may be said to be six chief modalities obtainable for therapeutic purposes. Where the more suitable apparatus is not available, *x* ray tubes may be excited, and D'Arsonval, Tesla, and Oudin currents may be derived from the static machine; but these are not included in this paper to-day.

The six forms which are here briefly outlined are:

1. The static bath, also known as static charge, static insulation, or general electrification.
2. The static wave current.
3. The static induced current.
4. The brush discharge.
5. The static spark.
6. The high-potential vacuum.

1. *The Static Bath.*

Here the patient comfortably reclines on a chair, placed upon an insulated platform connected to the negative side of the machine, and is untouched by any electrode and untroubled by any necessity for the removal of clothing, unless he or she is conscious of any metallic braid, hairpins, etc. Relaxed and comfortable, the operator or friends well away from the platform, the machine is started, and the patient should experience little except a feeling as of a gentle breeze passing all round him; but there is nothing alarming even to the most nervous patient. His sensations are quite pleasant. Such is its administration—the simplest and most soothing of all forms of static electricity. It is not as efficient as some others, nor are its therapeutic effects so marked, and the indications for it do not cover a very wide range; but where a constitutional sedative is required to the otherwise healthy but generally tired-out individual, or to a nervous or highly

strung patient, its effects are excellent, the patient often falling into a gentle sleep during its administration and awakening much refreshed and soothed.

As to the manner in which the current produces its effects it is difficult to speak. Experiments have been made which give negative results as to any demonstrable physiological action; but to anyone who has used this current properly it is evident that in some definite way the effects are produced, and with some diffidence I suggest the following hypothesis.

It is known that any uninterrupted static current has a tendency to flow over and remain on the surface of the charged body. When one considers that this current of very high voltage, but of minute milliamperage, is flowing continuously over the delicate nerve endings in the skin of the whole body, the thought presents itself that it may gently stimulate them and produce a sedative effect in the internal economy. It is not to be assumed that there is no penetrating effect of the static current in this particular method of applying it; but the hypothesis is put forward to attempt to explain how the clinical results might follow did we only get the surface charge.

2. *The Static Wave Current.*

This current is probably the most valuable in the science and art of electrotherapy, for there is no agent as successful in removing local infiltration or overcoming muscular spasm as is this form of static electricity. It was introduced to the profession in 1900 by the late Professor Morton of New York, and called by him the wave current, because in the completion of its circuit Hertzian waves emanating from the patient's person are produced.

In this form of treatment an electrode is placed on or over the part to be treated, the spark-gap of the machine gradually opened to the limit of the toleration of the patient—that is to say, as long as the contractions beneath the electrode are painless, these contractions being in direct proportion to the length of the spark-gap, and in inverse proportion to the area of the electrode. One point to be especially noted, which is essential in the administration of this current—for on it not only depends the comfort of the patient but the success of the treatment—and that is the rate at which the sparks cross the spark-gap. If they flow too rapidly a useless and almost unbearable tetanic contraction of the muscles is induced, while if too slowly the contractions are not sufficiently numerous to produce their therapeutic effect, and they are usually irregular and provocative of discomfort. The appropriate rate will vary within certain limits according to the area of the electrode and the sensitiveness of the part under treatment. As a general rule about 120 to 200 sparks to the minute will be found most effectual, and they should be as regular as possible. The average time for the application of the current is twenty minutes. In some cases during the last five minutes, instead of keeping the spark-gap at its maximum, the rods may be gradually opened and closed so as to produce a surging effect, thus contracting and relaxing the tissues beneath.

Turning now to the indications of the wave current. When properly applied, there is a local vibratory effect, and muscular contraction takes place. Local congestion is relieved, secretion is increased, and local pain is modified, either wholly or in part. It is indicated in almost every case of non-infective inflammation, either acute or chronic. The presence of pus, however, distinctly contraindicates its use. Inflammation is accompanied by congestion, or stasis, and it is this stasis which is relieved by the successive contractions produced by the current. It is therefore readily to be understood how wide a range of influence is possessed by this method of treatment.

The wave current is of great use in many diseases—for example, in myalgias such as lumbago, in synovitis, and in neuritis, such as sciatica.

3. *The Static Induced Current.*

The difference between this and the static wave current is that, whereas in the latter one electrode is attached to the patient and the positive side of the machine, the negative being earthed, therefore producing a constitutional as well as a local effect, in the static induced current two electrodes are attached to the patient, and the therapeutic effect of the current is localized between them.

The advantages of the static induced current are: first, we can get with an inferior or weak machine muscular contractions which we could not get when using wave current from the same machine: and secondly, these contractions are obtainable without any general effect on the patient.

The local effects of this current are similar to those of the wave current, though results are, as a rule, better with the latter, which is to be preferred in the majority of cases. The static induced like the wave current is chiefly valuable for its power of contracting muscle tissue, striped and unstriped, and it is able to exercise this power even in deep-seated organs. Hence good results of this current will be seen in cases of atony of the stomach, dilatation of the stomach, and ptosis with inactivity of various parts of the alimentary canal. It is in the treatment of obstinate constipation that it will be found most useful, and in certain cases where pain is present, and perhaps where large electrodes are indicated, the current may be used; but in general, while it should not be forgotten, it will be comparatively seldom employed, especially when the static machine is a powerful one and all is working well.

4. *The Brush Discharge.*

Cavallo, in 1786, described this current as "the electrode fluid coming from a wooden point," and this description holds good to-day. If, while the patient is receiving a static charge on the insulated platform, an earthed wooden or specially made electrode be brought near him, a violet discharge will be seen passing between the electrode and that part of the patient to which it is directed. It should be held about ten inches away. At this distance the patient will feel little or nothing, and may describe the sensation as that of a cool wind. If this distance be decreased the sensation is changed to one of a stream of hot sand being directed on to the part. The violet colour is due to the fact that the discharge, in its passage through the air, renders luminous the atmospheric particles, while it is attended with the formation of ozone and nitrous oxide. The antiseptic effect of these gases is of considerable therapeutic value in the treatment of septic wounds, abscesses, or ulcers, especially when it is remembered that the current has the further effect of the stimulation of the blood supply, thus relieving local stasis, diminishing induration, and aiding in the restoration of a normal circulation. These latter effects are more important from a therapeutic point of view than are the antiseptic properties of this current, just mentioned.

In cases of neurasthenia associated with low blood pressure the application of the static brush discharge up and down the spine is usually attended with much success. In its administration especial attention should be paid to that part of the back over the region of the adrenals. The stimulation of the afferent nerves provokes an increase in the activity of the suprarenal glands, which activity tends to raise the blood pressure. Therefore this form of treatment is indicated in many ill-defined pathological states associated with low arterial tension. It acts as a general stimulant when the patient has been brought low by overwork, worry, mental strain, or bodily pain, either alone or accompanied by insomnia. For insomnia itself, with or without headache (always presuming the blood pressure be low), the brush discharge applied by means of whisk broom to the top of the head gives most satisfactory results.

This current may also be used in cases of conjunctivitis, where it is applied for a few minutes by means of a camel-hair brush. In cases of non-purulent inflammation, such as acute gout, when the pain is so bad that the patient cannot bear the part to be touched, the static brush gently played over the area will soothe it in a wonderful way.

5. *The Static Spark.*

Even older than the history of the brush discharge is that of static sparks. It is the oldest form of static electricity on record and dates from 1734, when the Abbé Nollet first used the static spark as a therapeutic agent.

There are several varieties of spark derived from the static machine, but only one is here mentioned—the static indirect spark. It is really a current, and may be compared to a spark being discharged from a Leyden jar, the patient representing the jar. The whole of the static charge of the patient is suddenly focused to one point by the grounded ball electrode being brought near him and then discharged disruptively with the sudden appearance of light and sound. A powerful contraction of muscle and tissue at this time takes place which exercises a decompressor effect upon swollen and engorged tissues. The violent contraction drives out fluid from the tissues, hence the alleviation of pain by reducing the pressure of which it was the cause. The instantaneous soothing effect induced by fairly long sparks—10 to 15 inches—well directed along the course of the sciatic nerve, is in some

cases marvellous, and there is nothing so peculiarly adapted to remove deep-seated congestion as this method. Furthermore, not only is the pain relieved, but the muscular spasm which so often accompanies this—and other—pain is relaxed. Another use for the static spark in neuritis as sciatica is its diagnostic value. A patient will come complaining of pain along the entire distribution of the nerve. A series of short sparks, however, will show the exact position of the lesion, for whereas these sparks are for the most part only unpleasant, when they are directed to that part of the nerve where the lesion exists the patient will immediately complain of a sharp pain, so that when this procedure has been followed treatment need only be directed to that particular part where pain was elicited.

Its capacity for causing strong muscular contraction makes it useful in preserving the tone of a muscle whose power of motion is temporarily absent or limited, or, in fact, in temporary paralysis its effect is excellent. After a short period of sparking a general as well as a local diaphoresis will be noted showing a constitutional effect, in addition to that obtained in the region to which the sparks were directed. In deep-seated trouble in large joints, sparks applied in the spaces between the bony processes, as on either side of and below the patella, will often effect relief when other measures fail.

The chief therapeutic value of the static indirect spark lies in its power to produce powerful contractions in the tissues, and the consequent squeezing out of fluid contained therein.

6. *The High-Potential Glass Vacuum Tube Current.*

The vacuum tube is made in shape adapted to the rôle which it is destined to fulfil. It is attached to the negative side of the machine and applied directly to the part affected. The patient feels nothing, or perhaps a slight sensation of heat. Ozone is evolved on the surface of the electrode, and as the current flows a very fine and rapid vibratory massage is effected on the part to which it is applied. Hence it is useful in restoring healthy secretion to skin and mucous membrane where this is deficient. In acne and furunculosis its effect in early stages is wellnigh specific. After the skin has been rubbed for about ten minutes with a glass vacuum electrode in action it has a distinct "ozonic" odour. Rectal ulcer and simple fissure are usually benefited. In some forms of haemorrhoids its action is excellent. Acute capillary piles, especially if there be haemorrhage, are relieved, with the disappearance of anal spasm, very often in one or two treatments. *Post-partum* piles with prolapse are favourable cases for this treatment. In pruritus the application of this current is often very effectual, relieving the itching from the first. It has an excellent effect upon the vocal cords, being applied with the surface electrode to the outside of the throat for about twenty minutes. Public speakers and singers find great relief when their voices have been overstrained, or if they have been using the voice when the cords were congested. The voice becomes clearer after treatment.

In gynaecology it has been extensively used with striking success in some cases and equally indifferent results in others. Much of this discrepancy may be explained by, and put down to, either errors of diagnosis or improper use. For instance, an early vaginal catarrh is quite easy to cure with this current; but where the discharge is proceeding from a diseased endometrium it is naturally of little avail. In some cases of sterility, without any apparent reason, this current has so altered the nutrition of the parts as to bring about the desired result, or, at any rate, pregnancy has followed the treatment after years of sterility. In amenorrhoea with no obvious pathology the same shaped electrode as used for sterility may be used, and the electrical stimulation of the neuro-vascular processes in the pelvis very frequently results in the restoration of the menstrual flow. In leucorrhoea, although this is a symptom of disease rather than a disease itself, especially where there is passive hyperaemia, this current is most useful, the discharge immediately losing any unpleasant odour it may have had and becoming less purulent. This current has a beneficial effect upon the whole of the female genital apparatus, relieving congestion and promoting a more healthy condition generally.

Static currents are replaceable by no other form of electricity, and, with a competent knowledge of their uses, therapeutic effects can be obtained from them which appear marvellous to anyone using them for the first time.

To get these effects consistently, however, two factors are essential: (1) a proficient knowledge of static electricity, its characteristic effects, and of the nature of the disease to be treated; (2) a static machine of efficient power.

Some of the advantages of static electricity are that the applications are for the most part not unpleasant, that they are perfectly safe, and that the beneficial results obtained are apparent from the beginning of the treatment.

II.—HIGH FREQUENCY CURRENTS.

BY

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MY thanks are due to the honorary officers for their suggestion that I should contribute to the proceedings of the Section a paper dealing with high frequency currents in their relation to medical practice. I accept the invitation the more readily as for more than twenty years I have been personally engaged in the study and use of this therapeutic agent, and I am convinced that it has a large field of useful service.

In recent years, it appears to me, there has been some want of attention to this department of Electro-Therapeutics. The capacities of *x* rays, of radium, and allied agencies have made a strong appeal, and no one will question the dramatic interest and valuable results which have followed studies pursued in these departments. High frequency currents can scarcely boast an equally striking series of achievements. Nevertheless, they merit attention as a means by which various forms of suffering and disability may be relieved. I venture therefore to urge that their values should not be allowed wholly to be pushed into the background by their more attractive and impressive competitors.

It has been proposed that the good effects credited to high frequency currents are due purely to suggestion. I hope here to establish the negative of this proposition; but even allowing that some element of suggestion may enter into the successful use of these currents in functional nervous disease, the practical outcome is not the less valuable. And nowadays, with the therapeutic benefits of psychological influences ringing in the ears of us all, we may hardly remove from our available resources an agency which contributes to a practical end merely because in greater or less measure it includes an element of "suggestion."

The immediate aim of the medical practitioner is to gain relief for his patient, and if this is attained he may be content, without too critical an analysis of the exact nature and mode of action of the agencies employed. Yet in saying this I am not in the least allowing that high frequency currents owe their success to a mere impression made upon the mind and emotions. On the contrary, I propose to submit evidence to show that under the influence of these currents definite physiological actions are produced in the tissues and functions of the body, and that some of these actions are capable of actual demonstration and of precise measurement; also that certain forms of organic disease are favourably influenced by the application to them of high frequency currents. This evidence I will arrange under three headings, namely:

1. The effects of high frequency currents on the surface temperature of the body.
2. Their action on tissue metabolism, as indicated by qualitative changes in the composition of the urine.
3. Their therapeutic efficacy in diseased conditions in which the element of suggestion either does not exist at all or is reduced to a minimum.

1. Several years ago I collected a series of observations made with a view to determine the physiological actions of high frequency currents, and among these were measurements of the surface temperatures taken before, during, and after the application of the currents. I shall not inflict on you either the details of these observations or the precautions taken to exclude the chance of error. It is sufficient to say that the investigation was carefully conducted, and I ask you now to consider one or two charts showing considerable modification of the surface temperatures following the application of high frequency currents.

In Chart I (1)* where the thermometer was placed on the extensor surface of the right wrist, and only 250 ma. were passed for fifteen minutes, there is a rise in the surface temperature from

* Dr. Somerville showed a number of lantern slides illustrating his paper.

82·6° to 84° F., followed, after cutting off the current, by a fall in fifteen minutes to the original temperature.

In Chart III (2) where 500 ma. were employed and the thermometers were placed on the extensor and flexor surfaces of the forearm, there is seen to be a rise during the fifteen minutes of exposure of 7·4° F. in the case of the extensor surface and 10·6° F. of the flexor surface—that is, from 81·4° to 92° F. In both cases during the fifteen minutes immediately following the cessation of the current there is a fall of temperature of 4° to 5° F.

In Chart XIV the thermometers were placed over the right brachial artery and right forearm, 600 ma. being employed, and the electrode held in the right hand only. There is a rise of temperature on the forearm from 85·6° to 103° F.—that is, 17·4° during the twelve minutes' exposure. The patient, a medical friend of my own, was unable to bear the treatment longer, as the whole upper limb swelled and the bandages fixing the thermometers were uncomfortable. During the eighteen minutes immediately succeeding the cessation of the current there was a fall of 8° F. Details of all the investigations were published in *Medical Electrology and Radiology* in May, 1906.

The last chart I will show you, by way of contrast, demonstrates the effects of high frequency currents on the internal temperature of the body. Here again a rise occurs, but to a much less amount than in the surface records—namely, about a degree and a half. The temperature was taken in the mouth as the patient lay on the couch, before, during, and immediately after high frequency treatment.

Now these are hard facts and they cannot be explained away. Presumably they result from modification of the vasomotor control, but whatever the explanation, "suggestion" can play no part in it. Some considerable physiological action is produced and it is produced solely by the influence of high frequency currents.

2. Changes in tissue metabolism are most confidently measured by qualitative alterations in the urine, and it was this consideration that led me to determine what influence (if any) the high frequency current exercised in this direction. Again I omit details, but have a long series of analyses which show that under treatment with high frequency currents there is produced a more normal ratio between the excretion of urea and uric acid.

Let me show you three analyses:

CASE I.

Dr. A. Before treatment, April 4th, 1905, passed 35 ounces in twenty-four hours. Specific gravity 1025; deposit, "cayenne pepper" of uric acid; very faint trace of albumin; no sugar. Urea 2·7 per cent.=11·8 grains per ounce, or 418 grains in twenty-four hours. Uric acid 0·026 per cent.=0·113 grain per ounce, or 3·95 grains in the twenty-four hours. Ratio of uric acid to urea, 1 : 103 (normal ratio, 1 : 33).

Twelve days after treatment was commenced the quantity passed in twenty-four hours was 36 ounces. Specific gravity 1022; no albumin, sugar, or deposit. Urea 2·7 per cent.=11·8 grains per ounce, or 424 grains in twenty-four hours. Uric acid 0·075 per cent.=0·323 grain per ounce, or 11·8 grains in twenty-four hours. Ratio of uric acid to urea, 1 : 36.

The patient was an elderly medical friend. Previous to treatment there was a marked disturbance of the normal ratio between the excretion of urea and uric acid—namely, 1 : 103. Twelve days after high frequency treatment had been commenced the ratio closely approximated to the normal—namely, 1 : 36.

CASE II.

Mr. M. Before treatment, October 30th, 1906, passed 60 ounces in twenty-four hours. Colour, clear amber; reaction, moderately acid; specific gravity 1018·5; scanty mucoid deposit; no albumin or sugar; creatinin moderate. There were no bile pigments, pus, blood, urobilin, or haematoporphyrin; while the spectroscope revealed nothing abnormal. Urea 1·9 per cent.=8·3 grains per ounce, or 498 grains in twenty-four hours. Uric acid 0·0375 per cent.=0·164 grain per ounce, or 9·84 grains in twenty-four hours. Phosphoric acid 0·19 per cent.=0·83 grain per ounce, or 49·8 grains in twenty-four hours. Ratio of uric acid to urea, 1 : 50. Nitrogen 240 grains. Acidity in terms of oxalic acid, 0·08 per cent., or a total of 21·4 grains. By means of the microscope only a few very minute octahedral crystals of calcium oxalate were detected.

After eleven visits for high frequency treatment, on November 12th, 1906, the quantity passed in twenty-four hours was 40 ounces. Colour, opaque, turbid, light yellow; reaction, highly acid; specific gravity 1020; copious uratic deposit; no evidence of abnormal constituents as before. Urea 2·6 per cent.=10·3 grains per ounce, or 412 grains in twenty-four hours. Uric acid 0·105 per cent.=0·485 grain per ounce, or 18·3 grains in twenty-four hours. Phosphoric acid 0·28 per cent.=1·22 grains per ounce, or 48 grains in twenty-four hours. Ratio of uric acid to urea, 1 : 23. Nitrogen 230 grains. Acidity in terms of oxalic acid, 0·214 per cent., or a total of 43·4 grains. Microscopic examination showed a copious deposit of amorphous urates.

The patient was an active country gentleman. Before treatment the amount of uric acid excreted was subnormal—namely, 9·84 grains in twenty-four hours, and the ratio between the excretion of uric acid and urea was disturbed—namely, 1 : 50. After eleven visits the amount of urea excreted was less, while that of uric acid was increased and the ratio approximated to normal.

CASE III.

Mr. T. G. Before treatment, June 4th, 1907: quantity—an evening and morning mixed sample. Reaction, markedly acid; specific gravity 1023·5; no albumin or sugar. Urea 2·35 per cent.=10·9 grains per ounce. Uric acid 0·045 per cent.=0·196 grain per ounce. Ratio, 1 : 55. Acidity high, at rate of 0·25 gram oxalic acid per 100 c.cm. urine; this is nearly double the normal.

After seven applications of high frequency currents, June 12th: quantity—an evening and morning mixed sample. Reaction, acid; specific gravity 1017; no albumin or sugar. Urea 1·65 per cent.=7·2 grains per ounce. Uric acid 0·058 per cent.=0·25 grain per ounce. Ratio, 1 : 28. Acidity still high, though less than before—0·226 gram oxalic acid per 100 c.cm.

It is sometimes suggested that the improvement in the urinary excretion is due to nursing, rest, and careful feeding, but I have purposely selected the analyses of urines of three busy gentlemen, who were engaged in their daily work and who merely attended for treatment. Here once again we are outside the range of suggestion; at the same time we have an explanation of the sense of well-being which patients treated by high frequency currents almost invariably experience.

3. As regards the scope of high frequency currents in the treatment of functional conditions, painful or otherwise, the range is an extensive one. In a meeting such as this it would be out of place to enter into detail or to give particulars of individual cases, but I may remark in general that I have dealt successfully with numerous neuralgias of the larger and smaller sciatic nerves, the branches of the circumflex and musculo-spiral, the posterior scapular, the posterior and smaller occipital, and the trigeminal nerves. Rheumatic pains yield to treatment, and insomnia is overcome. Nervous headaches, and with them alopecia, are lessened; haemorrhoids, fissure in ano, and pruritus ani are relieved if not cured; skin affections such as eczema and acne, and even psoriasis, are benefited. Choreic movements subside, chilblains disappear. Asthma is often controlled, strumous glands decrease, and ulcers are healed. Incontinence of urine in both old and young is overcome. The pain succeeding fracture is subdued.

My purpose in this paper has been simply (1) to show that high frequency currents do actually occasion measurable changes in the physiological balance of the human body, and (2) to indicate that, apart from so-called functional disease, these currents afford therapeutic help in certain conditions where there is without question definite organic disease.

DISCUSSION.

The PRESIDENT asked whether low blood tension was not a contraindication to static treatment; also whether the openers of the discussion had had any experience in the treatment of *x*-ray burns as treated by the effleuve. It would also be interesting to know what Dr. Humphris meant by his expression an "efficient static machine." The speaker was one of those who in the early days took up high frequency and similar work, but he had been, unfortunately, overwhelmed by radiology. He was sure, however, that there was a great deal of value in these methods in properly selected cases.

Dr. HOWARD HUMPHRIS, in reply, spoke of the criticism which had been made on other occasions that the effects of these currents were due to suggestion. He had demonstrated by means of a potato and also a piece of meat—neither of which could respond to suggestion—that there was no doubt as to the actual introduction of heat into the tissues. Not only in high frequency but in ordinary galvanic applications it might be that the great majority of the effects were due to heat. An efficient static machine he would define as a static machine capable of being revolved at a rate which would produce a spark half the diameter of the plate. The spark between the gaps should be equivalent to, or little short of, the plate radius. As for the treatment of *x*-ray burns by the

effleuve, in theory it might appear that this was an efficient treatment, but the cases of *x*-ray burns with which he had had to do were treated by other means, preferably carbon-dioxide snow. Although electricity was old *x*-ray burns were new, and he thought that static electricity should only be used where the indications for its use were quite clearly defined and well established. In reply to a further question, he said that for high blood pressure there was nothing like the auto-condensation couch. Of course, it was very important to know before commencing treatment whether the pressure might not be compensatory.

X RAYS IN DISEASES OF THE SKIN.

BY

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THE time has arrived when the value of *x* rays in the treatment of skin diseases should be more generally known by the practitioner than it is at present. It is in many cases not only a definite cure, but by far the best means for obtaining that cure; and occasionally it is the only treatment when all other methods have failed.

The textbooks on dermatology are stinted in their praise of *x*-ray treatment, and in no condition do they recommend it as the first thing to try, but prefer to enumerate all the ointments and lotions in the Pharmacopoeia, irrespective of the discomfort caused to the patient or the ruin of his underclothing. Take, for example, psoriasis: the usual ointments only temporarily cure the complaint, but permanently ruin the clothing; now *x* rays will remove the eruption more quickly than the ointments, and the saving of the clothes will pay the *x*-ray fee. Textbooks on radiotherapy are vague and unconvincing when dealing with skin disease, and yet I cannot imagine any treatment of recent years more satisfactory in its present results, and more promising for future research.

Skin diseases are a side-line in most of our big teaching hospitals, and the student is expected to diagnose any case after about a dozen lectures and a similar amount of clinical experience. He cannot be blamed, seeing how much general knowledge he has to cram into so short a time. The fault is that there are so few men who specialize in this important branch of medicine, in comparison with the large number of sufferers; and hence the verdict "incurable" which has to be pronounced so often in cases of lupus, rodent ulcer, and many other skin diseases, where an early diagnosis would have meant an early cure. The inability to diagnose and treat applies to many of the less serious diseases, which are the unnecessary cause of pain, discomfort, and loss of work.

In this paper I do not venture to tell you how to diagnose skin diseases, but prefer to remain one of the angels who "fear to tread," as this is distinctly the realm of the dermatologist; but as medical men we ought to know the difference between an acute and chronic inflammatory condition; and assuming that we are able to discriminate between these two stages of skin disease, I propose to tabulate the various conditions which should indicate the prompt application of *x* rays. If the diagnosis of a dermatologist can be obtained, and collaboration with him is possible, by all means get it; but even then there are two things which must be insisted upon, and these are, first, that the dose must be prescribed by yourself, and secondly, no other metallic treatment must be given externally while the *x*-ray treatment is being given.

The first condition is obvious, and the second is because of the ill effects of metallic ointments or lotions covering or impregnating the skin. They may act as a wall or barrier to the rays, or their metallic secondary radiations may greatly intensify the action of the primary rays.

The secondary or more correctly characteristic radiations which are given off from metallic particles after being impinged upon by a beam of *x* rays, are practically unknown, except to the radiotherapeutist and the physicist. These rays are very soft, intense, and easily absorbed by the skin, and often account for patches of lupus breaking down, not because of the amount of primary rays they have received, but because of the prolonged metallic ointment treatment they have previously had, and the secondary radiations thus set up. *X* rays of course are blamed or their use discredited.

I believe these characteristic secondary rays are the clue to future successful research in the treatment of skin disease, chiefly because of the homogeneous nature of these rays. We know that a beam of ultra-violet rays when passed through a spectroscope is analysed into a series of rays of different wave-lengths; and these, if directed on to a film of bacteria, will produce lines similar to those produced upon a photographic film. These lines are due to the bacteria being killed, inhibited, or stimulated according to the wave-length of the particular ray which strikes them. Thus, rays of different wave-lengths have widely different therapeutic effects, and this applies to *x* rays; some with certain wave-lengths are wanted and others are not. Obviously, then, the thing to find out is the characteristic homogeneous ray, if any, which acts most beneficially upon each disease. This can only be done by getting the metal whose characteristic ray you want into the affected skin by injection, ionization, or by any other means, and filter out all the primary rays from your treatment tube, except those which will excite that particular metal. The trouble, I find, is getting the metal into the skin, but I have no doubt that others will be more ingenious than myself and therefore get better results. We do know that a small patch of lupus which has previously had zinc ointment well rubbed into it before *x*-ray treatment does better and heals more quickly than one treated without the ointment; this must be because of the secondary radiations.

How do *x* rays affect the diseased skin? We do not know this, any more than how ordinary sunlight affects the skin. We know only that it is by the absorption of these rays, and the conversion of their energy into some other form of energy of a lesser wave-length—namely, a degradation of wave-length. This effect, if suitable quantities are absorbed, results in a healthier condition, which enables the skin to fight invading micro-organisms and toxins, and to dispose of excessive degenerative tissues. Occasionally larger doses are given, with the object of directly killing neoplastic tissue, which from experience we find will be destroyed before the surrounding normal tissues are. The normal ones will then throw around a barrier of fibrous tissue, which finally takes the place of the neoplasm. This fibrous tissue formation after prolonged radiation is of great value in combating many forms of malignancy, but must be regarded as bad treatment, or I might better describe it as overtreatment, in the less serious conditions of chronic inflammation, where stimulation and absorption only are required.

Time is too short to discuss the technique of *x*-ray treatment, except briefly to say that a medium soft tube is the best, a gas tube of about 4 inches spark-gap, or a Coolidge tube with about 6 inches spark-gap—that is, if they are excited by a coil installation, which I think is the preferable means. The distance of the part treated from the tube should be kept as uniform as possible in order that the operator can estimate the exact dose he is giving in each case. If the treatment is likely to be a long one, as is often the case in old-standing diseases such as scrofulodermia, lupus, and eczema, remember that there is a saturation stage to a particular radiation—a stage at which the skin has absorbed all the rays it can healthily deal with, and any more of the same type are either useless or act as irritants. In order to overcome this, I alter the thickness of the filter every few weeks, and in this way am able to carry on longer and maintain the improvement which would otherwise have ceased. It is a simple point, but very effective. Starting with no filter, I add 0.5 mm. of aluminium after every four doses up to 2 mm., and work back to *nil* again.

Conditions contraindicating *x*-ray treatment may be divided into the following:

General, such as grave blood diseases, and disease of the blood vessel walls, and
Local, which includes acute inflammatory diseases of the skin and haemorrhagic skin troubles.

The symptoms and appearances of diseased skin which indicate the prompt application of *x* rays may be put under six headings:

1. Indurations and thickenings;
2. Itching;
3. Chronic infiltrations;
4. Lichenification;
5. Conditions requiring depilation; and
6. New growth.

These conditions, one of which is only a symptom—namely, itching—are easily detected, but as you know, they are present in a very large number of skin diseases, and present a

wonderful opportunity for the radiotherapeutist, because the results are cures in the vast majority of cases, also the treatment is pleasing from the patients' point of view, because it is neither painful, troublesome, nor destructive to their clothing. To get the best results courage is required, tempered with caution, which is only got by experience.

1. *Indurations.*—These are best seen in acne indurata, and about twelve to sixteen doses will flatten down a face to a decent smooth soft skin, which before was a mass of lumpy thick-walled abscesses. Some of the abscesses may have to be incised and emptied. All forms of acne do well under *x* rays.

Thickenings, such as are seen in keloidal formations, respond well to the same treatment, but sometimes require perseverance, even up to twelve months, and complete flattening will result. In these cases always rest after the slightest sign of reaction, and always keep altering your filtration. The thickenings associated with scrofuloderma do excellently, in addition to the treatment being the best possible one for the infected tuberculous glands or other tuberculous focus associated with this disease.

2. *Itching.*—This symptom responds more quickly to *x* rays than to any other remedy if the itching is not of parasitic origin. It should always be tried first. You can in almost every case of this kind, when it is not associated with a skin eruption, promise complete relief, or considerable abatement, after four weekly three-quarter pastille doses, but a further three to four pastille doses should be given after all itching has disappeared. Pruritus ani and pruritus vulvae are frequently complained of, and will respond quickly, even though the condition has been of many years' duration. The itching which is so often associated with skin diseases is usually relieved after a few doses, and, the scratching having ceased, the chronic inflammation soon subsides.

3. *Chronic Infiltrations.*—These are frequently observed in cases of eczema, especially the localized types, and a few radiations will soon stimulate a healthy reaction. Take, for example, those obstinate cases of eczema nuchae. Here we have violent itching as well as infiltration, and frequently, when every other remedy has failed, the rays will act like a charm and a quick cure result. Care, of course, must be taken not to cause baldness where the disease has invaded the hair at the back of the head.

4. *Lichenification.*—This is a condition which often follows upon a patch of eczema, and is characterized by some thickening, dryness, and often slight roughness, and sometimes trifling scaliness, with accentuation of the lines of the skin, and with, in most instances, closely crowded or coalescing, slight, flat, dull-reddish papules, usually caused by friction, scratching, and possibly to some extent to local medication. *X* rays quickly clear this condition.

5. *Conditions requiring depilation*, such as ringworm and sycosis, have so extensively proved the value of *x* rays as the best agent to adopt that further recommendation from me is unnecessary.

6. *New Growths.*—In cases of epithelioma, *x* rays should never take the place of excision where this is possible; it is always advisable to follow excision by a few doses of the rays.

In the case of rodent ulcer, excision is unnecessary because a permanent cure can be effected by a simple erasion followed by suitable *x*-ray treatment, a flat pale scar being the only trace of the previous ulceration. The method I adopt at the Manchester Skin Hospital is erasion of the rodent tissue, followed by full pastille doses, on three or four consecutive days—three for the smaller ulcers, and four for the larger ones. The area treated overlaps the rodent tissue by about one-eighth of an inch all round. The distance of the ulcer from the anticathode is seven inches, and the pastille is placed half-way. The results are excellent, and cures are obtained in practically every case, unless periosteum or cartilage has become involved, or the cases have been subjected to previous intermittent *x*-ray exposures over a long period. In these latter cases the fibrosis produced by the rays seems to take all the "kick" out of the tissues which appears necessary for the healing of rodent ulcers.

I do not doubt the good results obtained by radium, but an overdose of radium has much more serious consequences to the surrounding tissues of an ulcer than *x* rays have; and this, I consider, indicates the latter agent as being the more advisable one.

The further progress of an incurable rodent ulcer can be delayed for years by *x*-ray treatment, but this has not been my experience with radium.

DISCUSSION.

Dr. WOODBURN MORISON (Manchester) said that in treating pruritus ani a method was followed at Manchester which had been introduced by Pirie of Montreal. The patient was treated from below upwards while seated on the couch. A pad of cotton-wool was placed in position so as to give an oblong area where it was desired to treat, and the patient sat with the buttocks separated by the pad, a coin was used to indicate the focus for the rays, and the rays were directed from the tube below.

DIFFERENTIATION OF ACTIVE FROM QUIESCENT TUBERCULOSIS OF THE LUNG.

BY

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THE utility of the *x* rays in the diagnosis of pulmonary tuberculosis has been abundantly proved.

Unfortunately for patients, the profession as a whole has not yet come to recognize its importance and to avail itself of the help that can be obtained thereby. Apart from the inconvenience of sending patients to the radiologist, two reasons may be adduced for this, namely:

1. The difficulty of interpreting *x* ray plates of the lungs. To many general practitioners a radiogram of a fracture is like a letter in their mother tongue. The sharp clean-cut edges of the break are usually easily seen and interpreted. A radiogram of the chest, on the other hand, is like a letter in an unknown foreign language. The lines and shadows, normal and abnormal, mean nothing to them. The heart even with difficulty is recognized. The ribs alone indicate the area under observation.

The remedy, of course, is to drill the medical student in the interpretation of radiograms during his curriculum.

2. The inability of the *x* rays definitely to diagnose tuberculous disease in its earliest stages, and therefore their failure at that particular period when they could be of the very greatest value. Early tuberculous lesions are not gross—there is no infiltration, no fibrosis, no caseation. Congestion, cell proliferation, and cell destruction alone are found. These the *x* rays with ease penetrate, and no shadow is caused on the *x*-ray plate. The signs of early tuberculosis are not those of consolidation or increased density, but those of irritation and toxaemia—lessened functional activity of the lung and of the diaphragm, impaired mobility of the chest wall, increased muscular tone, vasomotor instability, lethargia, etc. Clinical facts undoubtedly indicate the presence of tuberculous lesions of the lungs prior to radiography.

The decision, therefore, as to the presence or absence of early tuberculosis is not a matter for the radiological laboratory to decide, but for the clinician with all the facts relative to the history of the case, the physical examination of the patient, and the chemical, cytological, and bacteriological investigation of the sputum before him, along with whatever negative or positive evidence has been derived from *x* rays.

In the diagnosis of active from quiescent tuberculosis of the lungs by *x* rays one must call to mind the stages traversed in the production of the disease and in the process of repair. There are, one might say, three stages in the production of the disease and three stages in the process of arrest.

The stages in the production of tuberculosis are:

1. The implantation of the organism and the development of a tubercle.
2. Local necrosis and the formation of a caseous nodule.
3. The rupture of the encapsulating membrane of the nodule and the production of an ulcerating cavity.

In all cases when active disease is present there are three associated conditions—congestion, alveolitis, and a local lymphocytosis. These are responsible for many of the signs on physical examination.

The three steps in the process of repair of tuberculosis of the lungs are:

1. Delimitation and localization—the congestion, alveolitis, and lymphocytosis disappear.
2. Fibrosis and calcification—the production of epithelioid cells and fibroid tissue secure ascendancy over the necrotic processes. As a result the affected area is walled up and shut off, and the caseous matter undergoes dehydration and calcification.

3. Contraction of the affected area and subsequent alteration of the general orientation of the thorax.

In all cases where lung tissue has been destroyed and healing has taken place we have compensatory hypertrophy and emphysema. This is specially marked adjacent to the affected area.

Seven conditions caused by tuberculosis may cause shadows in a radiogram of the lungs: (1) congestion of the blood and lymphatic vessels; (2) alveolitis in the neighbourhood of the affected area; (3) local lymphocytosis; (4) the infiltrated proliferated epithelioid cells; (5) fibroid tissue production; (6) caseation; (7) calcification.

The degree of density produced by these depends on their extent and their distance from the plate, and, generally speaking, is in the order in which I have given them. Which are indicative of activity? How do the shadows produced by active lesions differ from the shadows in quiescent disease? Can one definitely state by examining a radiogram that there is active disease present?

The first three or four conditions that I mentioned are alone indicative of activity—congestion, alveolitis, lymphocytosis, and epithelioid cell production. These produce, if anything, faint cotton-wool ball-like shadows, shadows resembling the cirrhose clouding that one sees in the sky on a summer day. The shadows caused by fibrosis, infiltration, caseation, and calcification are dense and dark.

In cases of acute or subacute phthisis, and in cases of chronic disease with a recent exacerbation, it is possible to state definitely that active disease is present. The wool-like shadows of alveolitis, congestion, and lymphocytosis are pathognomonic. In chronic fibro-caseous tuberculosis, where the shadow is dark and there is little wooliness or mottling, it is impossible in most instances to tell from a single radiogram whether or not the disease is active or quiescent. Then one's decision will be based on two things: (1) clinical facts of the cases; (2) serial radiograms.

Patients suffering from active tuberculosis always give symptomatic evidence, and usually have definite signs present. On inspection we get spasm of muscles, flushing, immobility of the chest wall, excessive sweating, particularly axillary, coldness of the hands, and dry skin and hair. On auscultation we may get granular, cog-wheel, or weakened respiratory murmur and subcrepitant or mucous râles. Auscultation may be negative. One should not trust to it. Lethargia, a low blood pressure, an adverse influence of exercise on the temperature and the pulse, are all indicative of activity. If there be no signs and no symptoms, no matter what the radiogram shows, there is no active disease in the lungs. Presumably, of course, a trained eye, ear, and hand decide the presence or absence of those signs and symptoms. Serial radiograms are very useful and very suggestive. Patients suffering from chronic tuberculosis of the lungs should be radiographed periodically, just as patients suffering from cardiac disorders have pulse and heart tracings made and filed for reference and comparison.

It is very interesting to trace radiologically the development of tuberculosis as it is advancing.

1. There is diffuse haziness of the affected area, and enlarged trunks radiating from the hilum. This haziness is best made out by radioscopy, using a low milliamperage and a small diaphragm. It may not come out at all on a radiogram.
2. The trunks become more accentuated, and budding—rounded or oval in form—appears on certain branches, particularly the upper branches. These buds are better seen by radiography than by radioscopy.
3. The buds become more numerous, becoming larger and more dense in the centre.
4. The buds coalesce and become cloud-like, particularly marked towards the hilum.
5. The shadows become more dense; diffuse mottling is usually seen peripherally.
6. The whole lung may become dark except for rounded clear areas significant of cavity formation.

A ring shadow may appear in the lung without previous consolidation. We have three such cases at Bridge of Weir Sanatorium at present. Infiltration, rapid disintegration, with little or no collateral inflammation and effort at encapsulation may account for this. The period required for the disease to develop from the hazy to the cottonwool-ball stage, and from the cottonwool-ball stage to that of opacity, varies greatly from a few weeks to a few years, depending on the resistance of the individual.

In a case of retrogressive disease one finds:

1. Disappearance of the mottling and haziness generally. There may persist a fair amount of haziness, due to thickened pleurae.
2. Development of greater density. The edges of the areas are sharply cut. This is largely due to the emphysema.
3. Retraction of the dull areas. They become smaller and ultimately less opaque.
4. Widening of the interspaces and freer movement of the ribs and diaphragm.

In a radiogram of moderately advanced active tuberculosis of the lungs one can usually make out at one part evidence of progressive disease, and at another evidence of retrogressive and quiescent disease.

By a series of radiograms of an individual one can tell definitely how the disease is progressing—favourably or adversely. In a case of doubt it is good practice to take radiograms from the anterior and posterior aspects at least. Personally I frequently also take one especially of the apices and two of the lungs, each lung separately. This should be repeated in a month or six weeks. Comparison of these radiograms enables one to decide whether immunity is being established and quiescence obtained.

To sum up:

1. Radiography does not show the presence of the earliest stage of active tuberculous disease of the lungs. Radioscopy may reveal it by a diminished translucency and by certain changes, particularly lessened mobility of the chest wall and a stammering diaphragm.
2. Acute and progressive tuberculosis shows itself by the presence of budding and cirrhose clouding, and by accentuated trunks radiating from the hilum. These are caused by hypervascularization chiefly.
3. In chronic fibro-caseous tuberculosis a single radiogram frequently fails to determine the question of quiescence or activity. Serial radiograms at intervals of four to six weeks indicate progression, adverse or favourable, and quiescence.
4. Radiography should be used simply to amplify. It can never supersede clinical methods in the diagnosis of tuberculosis of the lungs, and in determining its activity or quiescence.

POINTS IN THE DIFFERENTIAL DIAGNOSIS OF SIMPLE AND MALIGNANT BONE DISEASE.

BY

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[*Abstract.*]

DR. SABERTON'S paper was accompanied by a number of lantern views showing the *x*-ray appearances in the cases to which he drew attention. He spoke first of the comparatively rare disease known as osteitis fibrosa or fibrous osteitis. Very little was known of the pathological changes in this disease, and nothing as to its cause. In some cases trauma appeared to be an etiological factor. The disease seemed to be due to some constitutional peculiarity of the bone or osteoblasts, and a gradual conversion of the compact bone into fibrous tissue took place. The bone most frequently involved seemed to be the tibia. The salient clinical features of the condition were as follows:

Frequently only one bone was affected; there was liability to sudden fracture from slight injury; the shaft of the affected bone was bowed, and this was associated in some cases with expansion and egg-shell crackling; the patient usually complained of pain and aching in the affected limb.

The author then showed radiographs illustrating the early and late stages of the disease. In one case the patient—apparently a healthy male—gave a history of a feeling of weakness in the left leg, with swelling of the limb following fatigue. One day, while watching a cricket match, he stepped backwards, heard a crack, and fell with a broken leg. It was reported that in some cases following a fracture the bone recovered its normal condition. The author personally had not seen a case in which a return to normal occurred, but the fractures united firmly again, and apparent arrest of the disease took place. One patient, a female, was very crippled, and gave a long history of gradual bowing of the left tibia. Recently an egg-shell crackling had appeared over the tubercle of the tibia and inner side of the upper part of the shaft. This area was tender on pressure. The radiograph showed the obliteration of the medullary cavity, the curious changes in the compact bone, and the great variation in density when the disease was advanced. There was a fracture through the upper part of the shaft, and the radiographic appearances in this area suggested possible malignant degeneration. The limb was amputated.

It was important not to confuse osteitis fibrosa with certain other diseases which might simulate it, and in arriving at a diagnosis the clinical history had always to be considered in conjunction with the *x*-ray findings. The chief diseases to be considered in arriving at a diagnosis were:

1. Osteomalacia. This disease occurred most frequently in females, and was associated with pregnancy and lactation. Clinically a large number of bones were involved.

2. Osteitis deformans (Paget's disease). Usually many bones were affected. This was a disease of the middle-aged and elderly. Spontaneous fracture was not common. Some cases had been reported of a mono-osteitic type—that is, single-bone involvement. It occurred to him that this type might be really osteitis fibrosa, and not osteitis deformans.

3. A septic arthritis might present bony changes on radiographic examination simulating osteitis fibrosa. One patient suffered from a septic arthritis of the right knee-joint, which was thought to have been caused by a blister on the little toe. The absorption of the articular cartilages showed the case to be one primarily of arthritis, with secondary changes in the adjoining bones.

4. Chronic osteitis and syphilis. These diseases were usually characterized by marked periosteal overgrowth and increase of the cortex at the expense of the medulla.

In connexion with the last of these categories the author showed lantern views of an interesting case in which a possible sarcoma of the lower end of the femur had been suspected, but the radiographic appearances did not support that view. The conclusion he had arrived at was that the condition was either due to congenital specific disease or to some disease of the pituitary.

5. Osteomyelitis. This disease was associated with periostitis and the formation of bone abscesses and sequestra. Occasionally cases were met with which did not present all the classical features and in which a diagnosis was difficult to arrive at.

6. Malignant diseases of bone: (*a*) periosteal sarcoma; (*b*) carcinoma of the head of the humerus.

The author showed illustrations of both these cases. A typical example of periosteal sarcoma was in an apparently healthy child, 12 or 13 years of age, who was brought for *x*-ray examination of a swollen knee-joint. The leg, unfortunately, was not amputated, and the child had a most painful and distressing end. At the time of death, six months afterwards, the growth was almost as big as the rest of the body. Carcinoma of bone generally followed a primary lesion elsewhere. A patient who had had her breast previously removed for malignant disease, and was suffering from neuralgic pains radiating down the arm, was examined by *x* rays. The radiogram of the shoulder-joint showed evidence of a destructive process involving the head, great tuberosity, and upper part of the shaft of the humerus. Numerous scattered deposits were also present in the right lung.

7. Cystic disease of bone. The cystic condition of bone might be a very slow form of chondrosarcoma or myeloid sarcoma.

There were many other interesting bone conditions, some of them presenting difficulties in diagnosis, but it was not possible to deal further with this large subject in a short paper. He added that spontaneous fracture, or fracture from slight injury, might occur in other diseases of the bone, such as sarcoma, secondary carcinoma, osteomalacia, bone cysts, fragilitas ossium, and in cases of simple atrophy, either senile or the result of disease. Not long ago a case was sent to him for examination for the fracture of the radius and ulna caused by the patient merely resting one hand on the mantelpiece while stooping to light a piece of paper in the fire. The bones, so far as he knew, never united again. No definite pathological change could be seen in the radiogram to account for the fracture or its non-union.

DISCUSSION.

The PRESIDENT said that while it was generally quite easy to distinguish by radiological means diseased from normal bone, it was not always so easy to say whether a particular disease was simple or malignant. That was the first question the radiologist had to answer. One would have liked to have heard more of Dr. Saberton's views with regard to the fundamental differences in the structure of bone which led to the diagnosis on the one hand of a simple disease and on the other of a malignant.

LEAD-GLASS SHIELD FOR COOLIDGE TUBE, AND THE BUCKY-POTTER DIAPHRAGM.

BY

H. E. GAMLEN, M.B., B.S.DURH., D.P.H.

[*Abstract.*]

DR. GAMLEN, who accompanied his paper by an exhibition of the protective devices in question, expressed the view that *x*-ray protection was carried too far, and that many of the troubles attributed to radiation were due to the high-tension discharges and impure and overheated air of the *x*-ray room. The expensive protective apparatus with which the market had been flooded were in many cases unnecessary, hindered the work, and by their very appearance had a disturbing effect on patients. The glass protection shields as generally supplied were badly moulded, the pieces were of unequal thickness, and protected only the sides and bottom of the tube, leaving the top and ends bare.

He himself worked several hours daily with the Coolidge tube, generally at the fullest possible voltage, and he found it necessary to protect the anode and cathode ends by means of lead-glass sleeves and the top of the open shield by a thick-lined lead-cloth cover. To keep the tube cool a rubber tube in the lid was connected to a powerful fan motor. This method, however, proved cumbersome, and he approached the glass manufacturers of Great Britain and Belgium with a view to the manufacture of a heavy leaded protection shield, sufficiently large to enclose entirely the 7-inch Coolidge tube. None of the makers would undertake this, their excuse being its weight and cost. Finally, he sent his specifications to America, where a shield was made such as he now produced before the Section. He claimed that the shield was a great improvement on any on the market; it was not heavy, and could be moved freely in every direction. An air-blast kept the tube cool, the current of air working from the cool cathode end over the *x*-ray bulb and out at the hot cathode end, where it had free exit. This arrangement had been worked by him for hundreds of hours, and no tube had ever sparked through it. The lead equivalent of the glass was one-sixteenth of an inch (1½ mm.) of lead, and was in excess of what was generally supplied in this country and in America. He had tested this with his iontoquantimeter and found it correct.

When this shield was installed the operator might walk freely about the room during the time the tube was in action. He had placed Kienböck strips at a distance of six feet from the tube, and the radiation after three hours only acted upon them to the extent of No. 2 on the Kienböck scale; he calculated the erythema dose of the rays from a Coolidge tube working at 9-inch gap and passing through a filter thickness of 1½ mm. at from 24 to 30 Kienböck, so that it would take at least forty-five hours at this distance to cause a dermatitis.

So far, in deep therapy, it had been impossible to protect fully by means of a glass shield; the best protection was afforded by standing behind a lead shield 1/4 inch thick. He had intended to have a similar lead-glass shield made for the protection of a 16-inch Coolidge tube as used in deep therapy, but abandoned the idea on finding that his 16-inch Coolidge tube would not stand the necessary high voltage from the coil outfit.

The Bucky-Potter Diaphragm.

The speaker then went on to describe the Bucky-Potter diaphragm, the function of which, he said, was to absorb the scattered rays which were generated within the tissues of the body, and which differed only slightly from the primary radiation. In the past the only effective way to limit their action was by the use of compressors and diaphragms. The Bucky-Potter diaphragm was on a different principle; it did not restrict the intensity of the ray volume, but it prevented the secondary rays already formed from reaching the film or plate, thereby resulting in better contrast and definition.

The diaphragm or grid consisted of a mechanism moving during the whole exposure between the body of the patient and the photographic plate. The grid itself was made up of strips of lead alternating with strips of wood compressed together. The grid was so shaped that every part radiographed came under its action, the metal being spaced to allow the greater part of the primary rays to pass, while obstructing the secondary radiation. The normal distance between plate and tube was twenty-four inches. The moving mechanism was by means of strong springs, and the speed of movement was governed by the size of the aperture of an oil pump, which was set in action by the pulling of a cord.

The time of exposure was from two to three times the normal. Double intensifying screens and double-coated films were necessary for its rapid working.

DISCUSSION.

Dr. ROBERT KNOX (London) said that it was reckoned that 3 mm. of lead was required to give anything like adequate protection, and with the penetrating rays which seemed likely to be used in the future it was probable that greater protection even than this would have to be put in. In the future radiologists would have to work to maximum protection by shutting in the radiation as much as possible and getting rid of the more elaborate devices which Dr. Gamlen had referred to. In France he believed that oil was largely used as a medium of protection. It was important to remember that damage might be produced by radiations which did not cause the slightest trace of dermatitis. The dermatitis was the manifestation of an underlying effect, the first onset of which was to be avoided if possible. One should not wait for the dermatitis before arranging one's precautions. A good many of the cases in which there had been blood changes following *x*-ray exposure had developed without any dermatitis whatever.

Dr. WOODBURN MORISON (Manchester) said that of course there could not be absolute protection. The diaphragm had to be opened if the tube was to be used at all. Even with an absolutely protected tube box, save for the rays coming from the diaphragm, the moment the diaphragm was opened there would be *x* rays in every part of the room. He thought that the abdomen was the part of the body which the *x*-ray worker should take most pains in protecting. A great deal of the damage done by the radiation was done by that radiation which came out via the diaphragm and struck the abdomen of the operator. The protective arrangements in the *x* ray department of the Manchester Royal Infirmary were at one time deplorable, and a colleague of his found himself suffering from chronic diarrhœa. An arrangement was made whereby quite good protection was secured, but his colleague, on returning to work after an interval, had a recurrence of the trouble whenever he started screening. But as soon as he began to wear a leaded apron both back and front the trouble disappeared.

Dr. GAMLEN pointed out that the shield he had shown to the Section was intended only for use during *x*-ray treatment.

THE X-RAY TREATMENT OF TINEA TONSURANS.

BY

J. GIBSON GRAHAM, M.A.GLASG., M.D.EDIN.,

Physician, Electrical Department, Elder Hospital, Govan.

IN no department of *x*-ray therapy have *x* rays won a more decided triumph than in the treatment of tinea tonsurans. After an experience of over twelve years I can speak with some confidence of the results, and, although many workers have handled far more cases, yet I have treated many hundreds and have been in a position to keep in touch with a considerable number of my cases for years.

I propose to give the results of my individual experience in the hope that they may be of more interest than a mere review of the experiences of others. I began in the days when the naked tube was used, and passed on to specula and pastilles, and to the Adamson method, which is still the method I employ, with a slight modification, to which I will refer in a moment. In a paper like this it is not necessary to say more of the method than that by means of it the whole scalp is irradiated from five centres. Instead of the tripod arrangement I have used for several years past a single central leg or pointer made of wood. This allows me to regulate better the angle of my tube and get it more quickly into position, but it has the disadvantage of leaving a small tuft of hair unepilated unless one gives an additional dose through a fine glass speculum. There is now on the market a single pointer made of a material which does not possess this disadvantage. I use a hard tube, with equivalent spark-gap of 7 to 8 inches. A soft tube is of no use, and failures in the direction of underexposure are most often due to this cause.

I get satisfactory epilation with an exposure of eight minutes. The hair begins to loosen in fourteen days, and in from eight to fourteen days further the scalp is completely bald, smooth, and shining. This is what occurs in a typically successful case, but occasionally, in a small number of cases, and within a week to a fortnight of the exposure, an eruption of pustules, small subcutaneous abscesses, and subcutaneous indurations has occurred. The hairs, however, loosened in the usual time, and regrew well after the inflammation and suppuration were removed by treatment. There is another condition of a similar nature which I illustrate by quoting from a case of my own:

> A girl, aged 9 years, had the whole scalp affected. The usual ointments were vigorously applied for a month. She was treated on December 9th and 10th, 1919, and on December 24th hairs were noted loosening all over the scalp, and there was some erythema. On December 31st the affected areas were covered with scales or crusts which could be pulled off with the hairs, leaving a moist red surface underneath. This demanded some treatment, and ultimately did quite well.

Again, I have had cases in which dry scales formed in the affected areas, or some of them, and were very persistent, but ultimately these cases were satisfactory. These complications are, I think, to be attributed to the irritant applications to which the scalp has been exposed before *x*-ray treatment has been undertaken. The *x* rays are, no doubt, contributory owing to their devitalizing effect on the scalp tissues, allowing the invasion of pyogenic or other micro-organisms. The scales or scurfiness which I have noted may be due to the effect of the rays on the sebaceous glands of the scalp, paralysing their function, and thus bringing about the dry scaly condition, which, as I have said, may be very persistent.

Evidently two of the conditions to which I have referred can be obviated if the *x* ray operator could get into action *ab initio*. In some cases I have had, in which there was no previous treatment, the results were all that could be desired. Some medical men in Glasgow have been so satisfied with results which they have seen that they have their ringworm cases treated at once by *x* rays, but I fear this is not to be expected generally, and therefore the *x*-ray operator should see that time is given for the effect of irritant applications to subside and cleanse and soothe the scalp for a week or so before applying the rays.

I have had cases in which small patches of permanent alopecia resulted from exposure to *x* rays in the treatment of tinea of the scalp. These occurred some years ago, when I had not gained the experience which comes through practice. One was a patch, the size of a shilling, on the right parietal region; otherwise the hair growth was excellent, but this patch has remained for years, as I have verified personally. Another was a case which I had to irradiate again because the first exposure was insufficient. A permanent bald spot, the size of a five-shilling piece, was left on the frontal region; otherwise regrowth of hair was excellent. This case I have seen many times, years after the treatment.

These instances denote the danger which is to be avoided. As an operator gains experience the possibility of such an occurrence is reduced to vanishing point. Nurses or unqualified people should never be allowed to treat ringworm of the scalp with *x* rays. The worst case of permanent alopecia I have seen occurred in a case treated by a nurse.

Some years ago a distinguished radiologist and electrotherapeutist warned the medical public of the dangers of the action of *x* rays on the delicate nerve cells in the brains of children treated for ringworm. I have been able to keep in touch with many of my cases for years after treatment, and I have treated young children under 2 years; I have never seen any sign of impaired mental function attributable to the *x*-ray treatment, nor have I seen a report of such a case.

DISCUSSION.

Dr. W. MITCHELL (Bradford) said that he had been very much interested in hearing of Dr. Graham's experience, which largely coincided with his own. He had not had a single failure to cure, nor a disaster of any permanent kind, although in his early days he used to go about the streets of Bradford dodging bald-headed people. He elaborated a very simple plan for security. Like Dr. Graham, he believed in working with a very hard tube. He used a tube with a light anode. He believed also in allowing a fair margin for error. Therefore he worked with a low milliamperage and used a thin filter, placing the pastille under the filter, and getting four-fifths of the "B" dose; he also used a Kienböck adapter. He found pustular eruption quite common, and his own view was that there was some stimulating action on the staphylococci. He found no bad after-effects, except in a very small percentage of cases. He was quite certain that the *x*-ray treatment of tinea was the most satisfactory and certain method available.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

BILATERAL COLOBOMATA OF THE MACULA.

A MAN, aged 30, complained that his vision had been defective for years; he stated that he was unable to read, and that if he fixed his eyes in the direction of an object he could not see it, but that he could, indistinctly, see things to one side of him, also that he could get about at night fairly well, and even during the day did not stumble over objects in spite of his defective vision. His family history was negative.

His vision with both right and left eyes was for hand movements only. Retinoscopy showed both eyes to be myopic, but no improvement was obtained with glasses. His visual fields showed large central scotomata in both eyes; the peripheral fields could not be reliably taken owing to the loss of central fixation, but he appeared to see large white objects in the periphery of both fields. The cornea, iris, lens, and vitreous were normal in both eyes. The fundus of both eyes showed a pearly-white depressed area, at the centre of which would have been the macula. The defect was nearly circular, and measured about two discs in diameter. The edges were steep and sharply defined; the base was about 3 D. lower than the surrounding fundus; traversing the base were some large straight vessels, probably the long ciliary vessels passing forwards. Retinal vessels could be traced up to the margin of the defect and were then lost; the conclusion reached was that the retina was absent over the defect in the choroid. There was no pigment either round the margin of the defect or on the base. Except for the fact that both optic discs showed a temporal crescent, no other abnormality could be seen in the fundus.

The case is of interest on account of its rarity and its resemblance at first sight to central choroidal atrophy. Colobomata of the choroid frequently show pigmentation of their margins and sometimes of their bases, but the complete absence of pigment in this case is very much against a simple atrophy of the choroid, whilst the definitely punched-out appearance of the defects and their marked symmetry point to colobomata of the choroid.

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VESICULAR MOLE AND PLACENTA PRAEVIA.

ON June 10th I was called to attend Mrs. H., a primipara aged 22, for flooding. I found the uterus about one inch above the umbilicus and the os closed. She told me she had been losing on and off for the past two months and had had a severe haemorrhage the night before. Amenorrhoea had been present since the end of December. At the time of examination there was no loss. I told her to stay in bed, and subsequently made a provisional diagnosis of placenta praevia.

Nothing further occurred till June 22nd, when I found the os opened sufficiently to admit the tip of the finger. On June 24th the os was further opened, and I found the placenta presenting and detached all round as far as my finger could reach. My partner, Dr. Pittard, saw her with me, and we decided to terminate the pregnancy.

The same evening, however, we were urgently sent for as there was another flooding. I found the placenta presenting and the os about the size of a five-shilling piece, and easily dilatable. I perforated anteriorly to evacuate the liquor amnii, but none came. Then she had two smart haemorrhages, after pains, the second amounting to nearly a pint.

I decided to administer an anaesthetic and bring down a leg, but was surprised to find that there was no child there. On withdrawing my hand a mass of vesicles followed, and the uterus was then easily emptied by pressure from outside. Finally I explored the uterus and removed a few small portions remaining. I gave her 1 c.cm. pituitrin extract and there was no further bleeding. The vesicular mole removed filled an ordinary bed chamber. On the second day the temperature was raised, but it fell on the third day, and she made an excellent recovery.

Vomiting was a marked feature, beginning six weeks before and increasing in severity as time went on up to delivery. The labia minora were oedematous, but I did not test the urine before delivery.

The interest of the case lies in the fact that vesicular degeneration had taken place with a placenta praevia, which prevented vesicles from being evacuated.

Coventry. W. H. LOWMAN, M.B., F.R.C.S.

Reviews:

DISEASES OF THE CEREBELLUM AND OF THE STEM OF THE BRAIN.

THE recent interesting lecture upon the neo-cerebellum by Professor Winkler and the important Croonian lectures by Dr. Gordon Holmes on the clinical symptoms of cerebellar disease and their interpretation being still fresh in the minds of neurologists and many other readers, the very lucid and comprehensive work upon diseases of the cerebellum and the stem of the brain[1] by Professor CLAUDE and Dr. LÉVY-VALENSI, which represents the latest views of the French school of neurologists, is especially welcome.

After devoting a few chapters to general considerations, the authors give a clear and comprehensive account of the macroscopic and microscopic anatomy of the cerebellum and adjacent structures, illustrated by admirable schematic diagrams and pictures. We could have wished that an account of the comparative anatomy of the cerebellum had been included and reference made to the important work of Edinger, Bolk, and others on the cerebellum of animals in relation to their mode of life.

An admirable account is next given of the physiology of the cerebellum; it is based upon experimental researches, but full references to the literature are provided. On page 30 the authors ask whether it is necessary to admit that the cerebellum plays a special part in equilibration, co-ordination, dimension of movement, and muscular tonus, as pathological conditions causing clinical manifestations appear to suggest. Although clinical manifestations speak in favour of this view, the actual tendencies are towards unification of the cerebellar functions to a simple regulative action upon muscular tonus. The disturbances of equilibrium, for example, can be explained, according to the nature of the case, by the coincidence of labyrinthine lesions (tumour), by the rupture of cerebello-labyrinthine connexions, or more simply by disturbance of the tonic cerebellar functions upon the trunk and the lower limbs (vermis). This simplification of the functions of the cerebellum is especially defended in France by André Thomas.

The authors express the opinion that cerebral connexions exist for clonic discontinuous action of muscles, and cerebellar connexions for tonic and continuous actions. This was indeed the teaching of Hughlings Jackson.

In the chapter on cerebellar semeiology the authors point out that one of the difficulties, and the greatest, in its study arises from the anatomical and physiological associations of the cerebellum with the labyrinth. The recent researches of physiologists and clinicians have established certain laws which enable a differential and topographical diagnosis to be made, and in connexion therewith the beautiful researches of Babinski, of André Thomas in France, and of Gordon Holmes and Grainger Stewart in this country, and of Barany and Rothman are fully described, together with the numerous practical tests introduced by them. The value of this chapter is great, owing to its lucid descriptions of the tests and the admirable photographs and figures that illustrate them.

Chapter IV deals with anomalies, such as absence and malformation, partial agenesis, and heterotopia. In Chapter V various forms of cerebellar atrophies are discussed. The authors refer to an interesting case described by M. Claude and Mlle Loyez of crossed atrophy of the cerebellum occasioned by traumatic lesion of the internal capsule, showing probably that the atrophy resulted from the suppression of the motor stimulus. Mention is also made of an interesting case of olivo-ponto-cerebellar atrophy. This rare affection was described by Déjerine and André Thomas; subsequently a case was described by one of the authors, Professor Claude, of absolutely pure cerebellar syndrome. In connexion with this we may refer to the lecture by Professor Winkler (BRITISH MEDICAL JOURNAL, May 13th, 1922, p. 769) dealing with a case of a similar nature, which, he considered, supported the theory of a neo-cerebellum. The counterpart of the olivo-ponto-cerebellar atrophy, in which the middle cerebellar system is so markedly affected, has been described by Lejonne and L'Hermitte. This was a case of olivo-rubro-cerebellar atrophy in which the superior cerebellar system was affected, the middle being intact.

[1] *Maladies du Cervelet et de l'Isthme de l'Encéphale.* Par Professeur Henri Claude et Dr. Lévy-Valensi: *Nouveau Traité de Médecine et de Thérapeutique, XXXII.* Paris: J. B. Baillière et Fils 1922. (Roy. 8vo, pp. 439; 104 figures. Paper covers, frs. 35; boards, frs. 42.50.)

The chapter on tumours of the cerebellum is very interesting; in it reference is made to the remarkable work of Gordon Holmes and Grainger Stewart. The authors agree with these English neurologists that the modifications of the fundus are slow in development, and may even be absent in cases of extracerebellar tumours. They are of the opinion that the ataxy due to frontal tumours described by Bruns is due to *action à distance* and the effects of hypertension on the eighth nerve.

Attention is drawn to the considerable literature of cerebellar lesions due to cranial injury, lesions which were rarely met with before the great war. Here again the work of Gordon Holmes is mentioned together with that of André Thomas, Marie, and Chatelin. It may be remarked that Holmes, from observations upon nearly a hundred cases of local cerebellar lesions, concludes that when the vermis is affected a disorder of bilateral acting muscles occurs, and homolateral disorders of the limbs when the lateral lobes are affected. Otherwise, his investigations do not lend support to a belief in cerebellar localization.

The effects on the cerebellum of infectious diseases and endogenous and exogenous intoxication are next considered; it is interesting to note that when the authors are discussing exogenous intoxications they attribute the reeling gait of the drunken man to the action of the alcohol on the cerebellum.

There is a useful chapter on the cerebellum in mental disease, where reference is made to the anatomical investigations of Klippel and L'Hermitte, in the explanation of katatonia. Friedreich's disease and the differential diagnosis between it and Charcot-Marie's disease are fully considered. The authors next discuss the nature and diagnosis of diseases of the cerebral peduncles, pons, and the bulb.

Throughout the work full references are given at the foot of the page to the literature, and over a hundred photographs and illustrations serve to help the reader, although the descriptions of symptoms and the discussions of diagnosis are in themselves admirable for their completeness and lucidity of exposition.

This standard work is strongly recommended to all neurologists and others interested in the diseases of the nervous system.

F. W. MOTT.

DISEASES OF CHILDREN.

DR. LAWSON DICK'S book on *Rickets*[2] appears at a time when the etiology of the disease is under active experimental investigation and is the subject of vigorous discussion. He definitely takes a side in the controversy, maintaining that it is caused by unwholesome environment in early infancy, lack of fresh air, sunshine, and exercise, and denying that the factor of inadequate or defective diet plays any part in its origin. In building up his argument he is less concerned with what may be called clinical evidence—that is to say, individual cases of rickets in children and young animals—than with statistical data of the disease, its geographical distribution, and its history and duration. The rarity of the disease in Asia, China, and Africa and its prevalence in Europe and North America are emphasized; evidence is advanced to establish that it is uncommon in places where such conditions as prolonged lactation, the early use of farinaceous food, and a high incidence of acute alimentary disorders prevail and might be expected to favour its occurrence. There is an interesting and scholarly account of the history of the disease. The first and the classical description was given by Glisson in 1650, and the date and origin of rickets in England are assigned by him to the south-western counties at a period twenty or thirty years earlier. Dr. Dick argues that it probably first appeared in England under the late Tudor sovereigns, that it existed in the Netherlands and Northern France before this, and that the disease has not existed in Europe for more than four hundred years; these opinions are based partly on the absence of any descriptions in earlier medical treatises, mediaeval or classical, but chiefly on the absence of signs of rickets in the bones and teeth of skeletons before this period. The appearance and prevalence of the disease in Europe coincided with the transition from the agricultural and pastoral to the industrial era. At this period, without any important change in the diet of infants, there was a change from the environment of open air and freedom to that of confinement in unwholesome conditions. Dr. Dick relates that under the Stuarts even the infants of the rich were brought up in small, unventilated bed closets, and advances contemporary evidence of the prevalence of rickets at this period. Rickets to-day is less prevalent than it has been, but it still constitutes in the opinion of the author the most important single adverse factor in the national physique and health.

The book is thus a vigorous advocacy of the view that rickets is caused by bad hygiene, and not by bad food; and the author must be praised for his collection and able presentation of much evidence of a general and very interesting kind. There is perhaps a tendency to press the argument too strongly. "The great majority of the mothers breast-feed their infants, and the great majority of these children develop rickets" (p. 9). "Yet rickets is rampant in the colliery districts, in spite of the fact that malt and cod-liver oil are freely administered to these ailing children" (p. 75). Assertions such as these cannot be accepted without full evidence.

It should be added that adequate clinical descriptions of the disease are included, and that there is a particularly valuable account of the hypoplastic changes in the permanent teeth produced by rickets. The book as a whole gives a wide and interesting survey of the subject, and is written by one who has had clinical experience of the disease and possesses a thorough acquaintance with the literature.

The Management of the Sick Infant[3] is the somewhat vague title of a volume of over six hundred pages by Dr. Langley Porter and Dr. W. E. Carter. In their preface the authors state that they have written the book to supply the lack of "a textbook in the English language which deals exclusively with the peculiarities of disease as it occurs in infants," and especially to deal with treatment. The period of infancy is taken to cover the first two years, but the authors have included in their survey diseases which, though uncommon at this early period, do sometimes occur.

The plan of the book is curious; it consists of three distinct parts. The first deals with common and important symptoms of disease in infants, such as vomiting, diarrhoea, constipation, haemorrhage, cough, and convulsions; under each heading a catalogue of the various diseases that may cause the symptom is given, and the appropriate treatment for each is then indicated. There are certain advantages in this way of approach when symptoms, such as severe diarrhoea or a series of fits, demand in themselves special treatment; but it is apt to bring together a number of disorders which have little or no pathological relation to one another. This section also includes a chapter on nutrition, dealing with the common errors of feeding in infants and with their treatment. The second section follows the more usual classification of diseases according to the systems affected, with a regular description of pathology, symptoms, and treatment. Under the nervous system a clear and helpful account of the various types of mentally defective children will be found. There is also a chapter on infectious diseases. The third part deals with special methods of treatment and of diagnosis used in infants. It is the most concise and useful section of the book. The collection of blood intravenously from different sites; the injection of fluids and drugs by the hypodermic, intramuscular, and intravenous routes; puncture of the spinal canal, the thorax, and the abdomen; gastric lavage; the use of baths and packs; the different skin tests—these and other procedures requiring special adaptation for infants are carefully described; the directions are given in tabulated form and in many instances our understanding is greatly assisted by clear photographs. Food recipes and a formulary for drugs are provided. The book as a whole contains a great deal of accurate information, but its arrangement and presentation are faulty. The important subject of rickets is partly dealt with in the chapter on nutrition, and there are scattered references to it throughout the book; but in the index the only reference is to three prescriptions in the formulary. There is also the lack of a connected account of the normal physiology and growth of the healthy infant. The book is not well planned; and the impression of confusion and incompleteness which some of its chapters leave with the reader arises largely from this faulty planning. For this reason it cannot be recommended as a textbook for the student, but the practitioner will find in it many useful hints for treatment.

[2] *Rickets: A Study of Economic Conditions and their Effects on the Health of the Nation.* By J. Lawson Dick, M.D.Edin., F.R.C.S.Eng. London: William Heinemann, Ltd. 1922. (Demy 8vo, pp. xiii+488; 7 plates and other illustrations. 25s. net.)

[3] *Management of the Sick Infant.* By Langley Porter, B.S., M.D., M.R.C.S.Eng., L.R.C.P.Lond., and William E. Carter, M.D. London: Henry Kimpton. 1922. (Roy. 8vo, pp. 654; 54 illustrations. 42s. net.)

After an interval of four years the eighth edition has appeared of *The Diseases of Infancy and Childhood*,[4] prepared by Dr. EMMETT HOLT, with the co-operation of Dr. HOWLAND, of Johns Hopkins University, Baltimore. This steady appearance of new editions is the best testimony to the value of the book, which needs little further notice and commendation. It is one of the very best books on the subject in the English language, and the new issue, though showing evidence of careful revision and containing some additions, closely resembles its predecessor in general plan and text. A short account is given of encephalitis lethargica; of vitamins, in which the connexion of rickets with vitamin fat-soluble A is provisionally regarded as not proven; and of food idiosyncrasies in young infants, where the authors also take up a cautious attitude with regard to the association of infantile eczema with sensitization to food. The earlier sections of the book, dealing with infant physiology and growth, the principles of hygiene and nursery management, and the essential facts as to human and other mammalian milks, are admirable—complete in detail, and yet practical and easily followed. Indeed, on this part of his subject Dr. Holt speaks with altogether special authority, derived from his long combined experience of the ward and the laboratory. The rest of the book, in its account of the pathology, the symptoms, and the treatment of disease, is equally good, and is written first-hand from experience and from life. The clinical pictures of children suffering from disease are unusually clear and graphic. The illustrations are numerous and good; though they have been reduced in number, thirty new ones have been introduced. The volume is a little smaller than its predecessors; but with its eleven hundred pages it remains a large book, though one which gives a fairly complete survey of a subject which is wide, complicated, and important. Care has been given to the index, which is detailed and accurate.

THE TUBERCULOSIS CLINIC.

The Tuberculosis Clinic,[5] edited by Dr. NOEL D. BARDSWELL, is a manual composed of short monographs by several writers, dealing chiefly with the diagnosis and classification of the disease and with the organization of the dispensary in town and country. It is presumably written with the object of equipping the inexperienced tuberculosis officer with the information necessary for the adequate performance of his work. As is so frequent in books owning to a diversity of authorship, there is a lack of a unifying purpose in the ideas contributed by the various writers, which points to the absence of that close co-operation requisite for the execution of all tasks in which team work is engaged. Particularly is this noticeable in such questions as those dealing with pathological diagnosis and with treatment. Is the examination of sputum, pus, and urine to be undertaken by a pathologist or by the clinician? It is clear that the different authors tend to disagree on this point, and even the writer who is responsible for the chapter on pathological diagnosis does not seem to be very certain himself about the answer. If it be written for the pathologist we would condemn it as altogether too elementary; if, on the other hand, it be intended for the guidance of the tuberculosis officer himself there is a notable deficiency in the directions given as to the recommendation of methods, the interpretation of results, and the whole question of cytology. Unfortunately a compromise is proffered in the shape of an enumeration of the various technical procedures which may be employed by the immunologist without any definite indication as to the meaning of the results obtained. Again, with regard to treatment, opinions are obviously at variance. The writer of one section lays stress on the importance of continuing treatment at the dispensary itself, while the writer of another section would regard his duty as consisting in the supervision of the patient's treatment, leaving the actual details to be worked out by the practitioner in charge.

The chapter on clinical diagnosis is likely to prove very helpful—that part of it, at least, which deals with pulmonary tuberculosis. It is a matter of regret that the author has considered it necessary to add a description of the other forms of tuberculosis; having quite insufficient space to deal with the multiple manifestations of this disease in glands, bones, joints, abdomen, larynx, eyes, and genito-urinary system, he has contrived to cram them all into the compass of five and a half pages—an allowance barely enough to give more than a list of the various possible lesions.

The various difficulties attending the organization of the dispensary in rural districts are well brought out, and several valuable suggestions put forward as to the ways of combating them. The most attractive part of the book is the chapter on the urban clinic, contributed by Dr. R. C. Wingfield. Singularly lucid and delightfully concise, it is obviously written by a man who is speaking from considerable experience and who has no doubt in his own mind as to the general purpose of the tuberculosis clinic and the best means of carrying it into execution. Great emphasis is laid on the distinction between the medical and the social aspects of the clinic and on the importance of close co-operation between the two sides. On this point he is very explicit. For instance, he says:

> "No doctor in this world can cure or even improve the health of a consumptive workman with an invalid wife and several small children, nor can any social worker; but the two in conjunction can and have done so in many cases."

Finally two useful chapters on classification and on the keeping of reports are added. Though lacking in unity of vision the book should prove of value in virtue of the recommendations it contains from workers who are speaking from personal experience of the problems of the tuberculosis clinic.

AN ATLAS OF SYPHILIS.

The Atlas of Syphilis,[6] by Professor L. v. ZUMBUSCH of Munich, an English edition of which has recently been published, is altogether a work of considerable artistic merit. It is really a collection of colour photographs taken direct from patients suffering from syphilitic lesions. As the work is intended primarily for students and practitioners the aim of the editor has been to reproduce the more typical and the commoner lesions of syphilis rather than rarities. The bulk of the plates, however, are of skin lesions, as these lend themselves best to such a method of reproduction. Syphilitic affections of mucous membranes—as, for example, ulceration of the palate or of the pharynx—are not within the scope of colour photographs and are missing from the Atlas, although the editor has succeeded in reproducing such conditions as gumma of the tongue and papules on the labial mucous membrane. Examples of the morbid anatomy of syphilis have also been included, and the coloured photograph of syphilitic aortitis is a particularly successful reproduction. There are also some illustrations of *Spirochaeta pallida* seen under dark-ground illumination, and by methods of staining. These plates, however, have been reproduced from water-colour paintings and not from colour photographs.

Although the limitations of coloured plates as a means of teaching must be recognized, it must be admitted that the *Atlas of Syphilis* reproduces the appearance of cutaneous syphilis better than any atlas we have previously seen. The workmanship of the plates is excellent, and the special process which Dr. Traube has employed in the colour photography has given good results.

The letterpress, for the translation of which Dr. J. Snowman is responsible, is limited to a very brief description of the coloured plates. It is intended that the work should be used in conjunction with a textbook, and so used it should be of great value to anyone wishing to familiarize himself with the commoner external syphilitic lesions.

NOTES ON BOOKS.

MR. ARMITAGE'S little book on *Diet and Race*[7] contains three essays setting out evidence of an association between the diet and the anthropological characters of the races of mankind. The first gives some interesting particulars of the diets of many primitive tribes which lead the author to conclude that low stature and chronic undernutrition are causally related. The second and longest essay sustains the thesis that the intensity of pigmentation is largely determined by the racial habit in the matter of consuming salt: races taking much salt are, other things equal, fairer-skinned than races consuming

[4] *The Diseases of Infancy and Childhood, for the use of Students and Practitioners of Medicine.* By L. Emmett Holt, M.D., Sc.D., LL.D., and John Howland, A.M., M.D. Eighth edition, fully revised. New York and London: D. Appleton and Co. 1922. (Med. 8vo, pp. xix+1127; 172 figures, 7 plates. 6s. net.)

[5] *The Tuberculosis Clinic.* By Several Writers. Edited by Noel D. Bardswell, M.V.O., M.D., F.R.C.P. London: John Bale, Sons, and Danielsson, Ltd. 1922. (Demy 8vo, pp. v + 111. 6s. net.)

[6] *Atlas of Syphilis.* By Professor L. v. Zumbusch. London: J. Bale, Sons, and Danielsson, Ltd. 1922. (8¾×12; 31 plates. 20s. net.)

[7] *Diet and Race. Anthropological Essays.* By F. P. Armitage, M.A. London and New York: Longmans, Green, and Co. 1922. (Demy 8vo, pp. 141; 7 figures. 7s. 6d. net.)

little. The third paper deals with the mechanics of the jaw and the possible effect of diet upon the conformation of the skull. The medical reader will be of opinion that Mr. Armitage's knowledge of physiology is insufficient for the task in hand; thus, although it is quite true that we do not know very much about the chemistry of pigmentation, we know a good deal more than is to be found in Sheridan Lea's textbook. But Mr. Armitage's modest hope that "the perusal of these pages will stimulate someone to exploit completely the field I have ventured to look into" should disarm the technical critic. The literature of pigmentation is of course very technical, but Mr. Armitage might have consulted the monograph upon *Albinism* by Professor Karl Pearson, Dr. Usher, and the late Mr. Edward Nettleship, which contains much information relevant to his inquiry.

The man in the street, although his way is lighted by the flame arc, and hastened by electrical propulsion, understands less about electricity than about any other of the principal applied sciences. This is due to the fact that most of the developments in electricity during the last eighty years have been mathematical in character. The purpose of Mr. S. G. STARLING in his *Electricity*[8] is to make the subject intelligible to the general reader without resort to mathematics, and in this he has succeeded. He contrives, in a work of modest dimensions, and in a style which never loses the interest of the theme in a mass of technicalities, to trace the development of the science from the first experiments of wondering men who rubbed a piece of amber with wool, to describe the electro-magnet and some of its applications, and to lead up from Faraday's discovery of the possibility of producing current by mechanical means to the uses of that current in the production of motive power and illumination. Then he goes on to the telegraph, the telephone, and "wireless," and after this to electrolytic processes and x rays and radio-activity. With diligent study and continual reference to the glossary of electrical terms which is appended, the reader should acquire sufficient understanding of the theory of the apparatus of which he daily makes use to be able to act helpfully in an emergency due to some electrical accident or failure. Medical electricity does not come within the author's province.

A new edition of *The Financial Times Income Tax Guide*[9] has lately been issued. This summary of the Income Tax Regulations and guide for taxpayers seeking a return of overpaid tax or desiring to make sure that their assessments are not incorrectly charged is clearly printed and well arranged. Undoubtedly good value is given for the price demanded. We rather doubt the advisability of endeavouring to compress into such small compass information on the excess profits duty and the corporation profits tax; the space so occupied might have been utilized for setting out more detailed instructions as to the expenses properly chargeable in computing profits and similar matters. The provisions in the Finance Act of 1922 have not been overlooked, but the author has fallen into the error of not rewriting all portions of the booklet affected; for instance, on page 19 we are told that Schedule D covers the salaries of persons employed by private traders, which is incorrect and inconsistent with the statement on page 20 that employees' assessments are transferred to Schedule E by the 1922 Finance Act.

[8] *Electricity: Science in the Service of Man.* By S. G. Starling, A.R.C.Sc., B.Sc., F.Inst.P. London: Longmans, Green, and Co. 1922. (Demy 8vo, pp. 253; 127 figures. 10s. 6d. net.)
[9] London: *The Financial Times*. 1922. (1s. net, post-free 1s. 1½d.)

Nova et Vetera.

"BORN WITH A CAUL."

MAN is a credulous animal. Witchcraft is nearly, if not quite, obsolete in England, but many people will not light three cigarettes with one match, and the Harrow Council has soothed the apprehensions of its citizens by substituting "12A" for "13" on the Harrovian street doors. One of the most remarkable and ancient superstitions is that connected with the child's caul. It seems strange that anyone should think that a human being's future fortune could be affected by the manner in which the amnion and the foetus parted company, that the child who passed in the usual way through a rent in the membrane should be less lucky than the one who carried away part of it over his head. Yet it would be rash to conclude that this belief, which is at least 1,600 years old, is even now quite dead, for as late as 1903 a caul was offered for sale in the advertisement columns of the *Globe*, and in 1895 two cauls were advertised in the *Bazaar*, one for £5 and the other for £1. These are bargain prices as compared with those asked by the advertisers in the *Times* of May 6th, 1814, who offered five cauls for sale: two of twin children for 35 guineas, and others for slightly lower prices—one, indeed, "very complete," being priced as low as £10.

The superstition that it is lucky to be born with or to possess a caul has been general throughout Europe. The French have a saying of a fortunate person, "Il est né coiffé." In Germany, according to Grimm, children born with a "Helm" see ghosts, spectres, and witches—a privilege of doubtful value. Similar beliefs have prevailed in Holland and Iceland. Cauls appear to have been valued by Roman lawyers in the fourth century. The possession of one of these was believed to make its owner fortunate and successful in his pleadings. At that time nothing seems to have been said of its value as a prophylactic against drowning, for which it has been most valued in this country. The belief that cauls were lucky was very prevalent in the early days of the Church, and St. Chrysostom denounced it. In *The Golden Bough* Sir James Frazer states that among some Asiatic islanders

"a child born with a caul is expected to enjoy in later years the gift of second sight—that is, that he will be able to see things which are hidden from common eyes such as devils and evil spirits."

In the island of Timor a fertilizing virtue is ascribed to a caul:

"It is dried and carefully kept in a box. When rice-stalks turn black and the ears refuse to set, a man will take the box containing the caul and run several times round the rice-field in order that the wind may waft the genial influence of the caul over the rice."

It is worthy of note that among many primitive peoples very great importance is attached to the disposal of the placenta and umbilical cord. Sir James Frazer says that in some cases the placenta is carefully preserved under the house, and is believed to be a twin being of the child and the procreator of its children. It is the seat of the external soul.

The word "caul" means simply "a close-fitting cap," and as late as the beginning of the last century it was still used for a skull cap.[1] That the caul sometimes more resembles a hood than a cap is shown by the story quoted by Burton in his *Anatomy of Melancholy*, from one Guianerius,

"of a silly jealous fellow, that seeing his child newborn included in a caul thought sure that a Franciscan that used to come to his house was the father of it, it was so like the friar's cowl, and thereupon threatened the friar to kill him."

In the north of England a caul is known as a "silly how" or "hood." "Silly" (German *selig*) means primarily "blessed" or "fortunate," and only secondarily "feeble-minded." In those parts not only is the original owner thought to be lucky, but this luck can be transferred to anyone who owns or preferably carries the caul. At the same time there is or was till recently a prevalent belief that there is a sympathetic relation between the original caul-bearer and the membrane, when they are separated. Several writers in *Notes and Queries* have testified to this. By some it is believed that if the caul becomes moist its absent owner is in trouble; by others, on the contrary, if it shrivels up its owner is wasting away.

A writer in *Notes and Queries* of October 12th, 1889, quotes from the *Leeds Mercury* an instructive account of what may well be the birth of a legend about a caul. At the time of the birth of a certain child the precious membrane was laid aside by the nurse for safe-keeping upon a Bible, where it remained unnoticed until it was dry. It was then found to have the words "British and Foreign Bible Society" impressed upon it. There was tremendous excitement among the gossips, and despite the obvious but prosaic explanation given by the doctor in attendance, the neighbours persisted in regarding this as a miraculous occurrence and declared that the child was born to be a missionary.

In *David Copperfield* Dickens wrote:

"I was born with a caul, which was advertised for sale in a newspaper at the low price of 15 guineas. . . . There was only one offer for it—£2 in cash and the balance in sherry."

Apparently Dickens meant to intimate that even in seafaring Yarmouth cauls were already discredited. A dramatized version of *David Copperfield* was produced at the Strand Theatre in 1850 under the not very attractive title, *Born with a Caul.*

The will of Sir John Offley, knight, of Madely Manor, Staffordshire, which was proved in 1568, bequeathed the caul with which he was born and which is described as contained in "one jewell done all in gold enamelled" as an heirloom.

[1] See the description and portrait of General Mack, reprinted from the Memoirs of Major-General Le Marchant in the *Journal of the Royal United Service Institution*, vol. lxvi, No. 462, May, 1921.

British Medical Journal.

SATURDAY, SEPTEMBER 23RD, 1922.

A CANADIAN MEDICAL CURRICULUM.

As was fully set forth in the Educational Number of the JOURNAL (published on September 2nd), the General Medical Council's resolutions and revised recommendations regarding the curriculum of study for entry into the medical profession take effect from the beginning of 1923. The same subject, from the point of view of the granting of its own degrees, has been occupying the consideration of the University of Toronto, the broad result being that, beginning with the session 1919–20, a six years' course is now required for every graduate. The current *Calendar* of the university affords material for comparison of the principles followed in this country with those which have actuated the Toronto authorities.

The difference in minimum duration of study—five years here and six in Toronto—is nominal and negligible, the subjects of chemistry, physics, and biology being part of the medical course at Toronto, whereas here the first and second of these must in future be passed before matriculation, and the third may be passed immediately after it. A point of importance, however, is that the minimum age of entry is on the completion of the seventeenth year both here and in Toronto, so that the earliest possible date of registration is a year later at Toronto. The graduate of that university must have completed the twenty-third year of his age, instead of the twenty-second, as with us; he must, in short, be a little more mature in outlook and experience of life before he can enter upon the practice of medicine through the Toronto portal. That is a significant first sign of the general conception there of the qualifications which should be possessed by a member of the profession. When we come to note the contents of the curriculum, the conception is developed. At the end of his first year the student must pass an examination in "science and civilization and English expression." The Toronto view, in general, is well expressed in the *Calendar*, where the student "is advised to devote a certain proportion of his optional hours to the study of such subjects of general knowledge as will assist in providing him with that breadth of outlook and catholicity of interests which will enable him to enter with intelligence into the life and interests of the communities with which he may find himself associated, and to speak and write in a clear, simple and convincing manner." Again, as a preparation for general practice "the student should remember that his profession will be at least as much a branch of social service as of technical scientific practice, and that upon a number of occasions in his career he will likely be called upon for advice and guidance in matters in which not only his medical skill and knowledge will be involved, but also social, ethical and economic factors, a right understanding of which will often enable his services to be much more effective"; and he is therefore to acquire some knowledge "of the leading principles of ethics and economics, including sociology." Reference to "optional hours" in the first of these quotations calls attention to a prominent feature of the Toronto curriculum. In every one of the six years there are optional subjects to be selected under the guidance of a professor appointed to act as students' adviser. The choice will depend largely on the particular field of work to which the student is likely to devote himself, looking to his qualities and inclinations; but no attempt is made by means of optional classes in the later years of the curriculum to train students as specialists.

The Toronto University plan is very interesting and very attractive. It aims at making its medical graduates not merely doctors but men of culture. When Europe was slowly and blunderingly emerging from mediaeval darkness it was very long before the practice of medicine received any appreciable benefit from the newer knowledge, yet even then some learned men endeavoured as physicians (in distinction from apothecaries) to apply scientific principles to the treatment of disease. Their learning was much more general than medical, yet they obtained some guidance by relying on observed facts of nature. In modern times, and never so much as in the present day, scientific medical research and the applications of accumulating knowledge to the prevention and treatment of disease have become so absorbing and so extensive that five or six years can be far more than fully spent without going beyond the narrowest limits of purely medical study. At the same time, it is most desirable that the modern doctor should be more than a mere doctor—that he should have a wide outlook, and know something of the humanities, in the old sense of the term. Of course, he learns much after he does enter on practice—all his life he ought to be learning. That aspect of the matter cannot be too strongly pressed. If he wishes to do justice to his work and to himself he must always be a student. The conception of a medical career must never again be that the obtaining of a qualification enables a man to settle down to earn a living on the basis of the knowledge he has acquired once and for all at college. But the present question is, What foundation of general culture should be laid by means of definite instruction? Ought it to be confined to the pre-curriculum stage, or be extended into the period of medical study? In this country the former is the method followed; in Toronto University evidently it is the latter. The system there is to some degree facilitated by the method of options, and for the rest we take the view to be that some non-medical subjects are more important to the doctor than some items in the strictly medical courses. Whether there is any difference in the matriculation standards between Toronto University and the universities in this country we do not know, but any such difference would be a relevant consideration in comparing the two schemes. It is, however, a question of the balance of advantage. The more a doctor knows about all medical subjects the better it is in whatever line he may specialize. Yet the more also he knows of science and culture outside of medicine the better it is. But a quart cannot be put into a pint pot, and life is too short and too uncertain to justify the devoting of more than a limited time to professional training. It would be interesting to know whether the Toronto curriculum was devised by the medical faculty alone or by the whole senate of the university. If the latter, then naturally the importance of the humanities would be prominent throughout the entire discussion of the scheme. On the other hand, it is just conceivable that a body like our General Medical Council, wholly medical in membership, and acquainted not only with medicine, surgery, and midwifery, but with the importance of all the special subjects taught at the schools, might tend to deal with the problem rather in a strictly professional than in a university frame of mind.

Going more into the details of the Toronto curriculum, it may be noted that the *Calendar* of the university points out that no prescribed course of study of practicable length can fit the student for all the special careers the profession of medicine offers; he is urged early in his course to make up his mind whether he intends to go into general practice, to specialize in medicine or surgery,

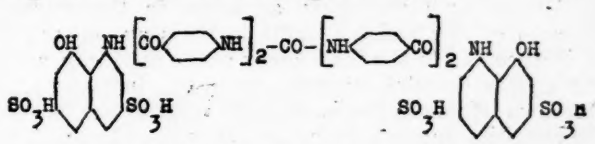
or to make his career in laboratory investigation and teaching, public health, or psychiatry. The six years' curriculum provides that the student may supplement his ordinary medical work by a somewhat more intensive training than is needed by all students, so as to prepare him for some particular type of medical career. A number of courses of optional study are provided. Among the subjects open to the first-year student, English history, scientific French, or scientific German is especially recommended. At the beginning of his second year it is considered a decided advantage to the student who aims at laboratory investigation, hygiene, or psychiatry in his career to make his choice, and upon it the optional subjects for the second and subsequent years largely turn. The student who is preparing himself for a specialist career in medicine or surgery is recommended to equip himself as thoroughly as possible in the introductory medical sciences, and it is suggested that in his second and third years the bulk of his optional studies should be chosen from subjects of this kind; he is, however, also required to select during both years one course in a subject such as history, economics, philosophy, or psychology. In like manner those aiming at careers in public health and laboratory investigation are advised to be guided by the requirements of the subject in which they desire to work, but they are reminded that in all paths of laboratory research the importance of mathematics is rapidly growing. Students attaining a certain standard in the courses of the first three years are allowed to continue taking optional subjects during their fourth, fifth, and sixth years, while others are required during their fourth year to take "review courses" in certain of the fundamental medical sciences, and, in the fifth and sixth years, in certain subjects of the preceding years. Assignment to these groups is made by a special committee of the Faculty of Medicine, which also decides upon the courses to be reviewed and allots the students to each. A student earning a good report during his fourth or his fifth year may be promoted from the "review group" to the "optional group"; but, as already noted, emphasis is laid on the principle that no attempt is to be made in the optional classes of the later years to train students as specialists. Thus, such subjects as laryngology, ophthalmology, and radiology may not be chosen at that stage, since it is thought unsound to train men to be specialists in these fields until they have thoroughly rounded off their medical or surgical education and served a year as a resident in hospital—an opinion with which there will be general agreement. On the other hand, students who have definitely decided that their future career lies in one of the specialties may, during the time set apart for optional study, take courses in the pre-medical or fundamental sciences upon which these specialties depend—for example, in those parts of physics and physiology that deal with optics, acoustics, or radiology.

The Toronto scheme is just what might be expected from a young and vigorous country with a fresh and open outlook. Its developments and results cannot but be watched with appreciative sympathy by all who have at heart the broad interests of the advancement of medical and general learning.

"BAYER 205."

A CURIOUS illustration of the German desire, not unnatural in itself, to regain the tropical colonies lost by the folly of the rulers of the German Empire, is afforded by a discussion which took place at a meeting of the German Association of Tropical Medicine at Hamburg. We have not seen a full report of the meeting, but the *Times* correspondent in Hamburg reports that one of the speakers said that "Bayer 205 is the key to tropical Africa, and consequently the key to all the colonies. The German Government must, therefore, be required to safeguard this discovery for Germany. Its value is such that any privilege of a share in it granted to other nations must be made conditional upon the restoration to Germany of her colonial empire." Some account of the drug manufactured by the Bayerische Farbwerke and provisionally named "205" was given in our issue of May 20th (p. 807), when we quoted Dr. H. H. Dale's opinion that it was a remarkable curative agent in trypanosome infections. A general account of the probable chemical relationship of "205" is given by Dr. King in the sixth Annual Report of the Society of Chemical Industry (1921).

In 1904 Ehrlich and Shiga discovered the trypanocidal action of trypan red, a compound formed by combining one molecule of tetrazotized benzidine-mono-sulphonic acid with two molecules of sodium naphthylamine disulphonate. In 1906 Mesnil and Nicolle[1] investigated a series of dyes containing amino-naphthalene-sulphonic acid and found that the most active trypanocidal agent was a dye prepared by the Bayer firm. Little notice was taken of this work, and the discovery of salvarsan diverted attention from the trypanocidal dyes to the organic arsenic compounds. The Bayer firm, however, continued to investigate the trypanocidal dyes and discovered that compounds of this type which were not dyes might still be active trypanocidal agents. They took out a large number of patents, and the type of compound to which the firm has paid special attention is represented by the following formula:



A number of substances of this type have been found to be very active trypanocides, and probably Bayer 205 is a derivative of this type. Bayer 205 is a white powder, freely soluble in water, forming a colourless solution, which can be sterilized. Animal experiments[2] have shown that it is an extraordinarily powerful trypanocidal agent, and that a single dose of it will produce immunity to trypanosomes for several weeks or even months. Mayer and Zeiss, for instance, found it cured infection with five different kinds of trypanosomes, that the ratio between the minimal lethal and minimal curative doses was as high as 167 to 1, and that a single dose of 3 mg. rendered a mouse immune to trypanosomes for three months. Recurrences were found to be extremely rare when infected mice were given a single curative dose of the drug.

The various workers have reported curative effects on trypanosomal infections in mice, rats, guinea-pigs, rabbits, dogs, and horses. In England Wenyon[3] found that the drug was an extraordinarily effective trypanocidal agent. A brilliant success has been reported in a case of sleeping sickness.[4,5] The case was of a year's standing, and had been treated unsuccessfully with arsenic, antimony, and emetine. Four doses of "205," making a total of 3.5 grams, were given. A few hours after the first dose the fever disappeared, and a complete cure appears to have been produced, for four months later there were no signs of recurrence of the disease.

The drug therefore appears to be a trypanocidal remedy of the first importance, and the fact that a

[1] *Ann. Institt. Pasteur*, 417 and 518, xx, 1906.
[2] Haendel and Joetten, *Bull. Institt. Pasteur*, 131, 19, 1921; Mayer and Zeiss, Ibid., 133, 19, 1921; Walther and Pfeiler, Ibid., 380, 19, 1921; Miessner and Berge, Ibid., 380, 19, 1921; Mayer, Ibid., 248, 20, 1922; Schuckmann, Ibid., 247, 20, 1922.
[3] Wenyon, BRITISH MEDICAL JOURNAL, 1921, ii, 746.
[4] Muhlens and Menk, *Muench. med. Woch.*, 1488, 46, 1921.
[5] Yorke, *Ann. Trop. Med. and Paras.*, 479, 15, 1921.

single dose confers prolonged immunity to trypanosomes suggests that it will be of the greatest value as a prophylactic. A commission of German doctors is now in Rhodesia testing the drug, and our knowledge as to its action in man will soon be much more extensive. The discovery of "205" promises to mark a great advance in tropical medicine, but it is a remarkable fact that England should be dependent on Germany for this advance in tropical medicine, for at present Germany has not a single colony, while England has the largest tropical empire in the world. It is not a position of which we have any reason to be proud, but its cause is simple. Germany appreciates the value of pharmacological research and we do not.

THE INTERNATIONAL CONTROL OF DANGEROUS DRUGS.

AMONG those who seek to reduce the supply of drugs of addiction, such as opium, morphine, and cocaine, to something approaching the amount required for legitimate purposes, the news of the destruction by fire of the great Darmstadt chemical works of Merck, last Friday, will be read with equanimity. While the League of Nations has so far found it difficult to determine with precision the amounts of these drugs required by different countries for medical and scientific purposes, it appears to be satisfied, as is the man in the street, that the supply is grossly in excess of legitimate demand, and that enormous quantities pass into illicit hands and are put to vile purposes. In the BRITISH MEDICAL JOURNAL of August 19th we drew attention to the alarming increase of this sinister traffic in Paris and other parts of France and to the inadequacy of the fines imposed on the agents detected in carrying on this lucrative trade. Our own Home Office is similarly alive to the fact that the penalties imposed under the Dangerous Drugs Act of 1920 are insufficiently deterrent, and it is stated that an amending bill has been drafted which will authorize twelve months' imprisonment with hard labour for a first offence.

In these columns for the last decade we have uniformly urged the need for international control, not only of the distribution, but of the production of these perilous habit-forming drugs. So long as the actual growth of the *Papaver somniferum* and the *Erythroxolon coca* is unlimited and unsupervised the market will be liable to be flooded with their alkaloids and preparations and the excess of supply over legitimate demand will find its way into unlawful hands and be prostituted to vicious uses. In the memorandum compiled by the Advisory Commission of the League of Nations, based on the replies to the questionnaire which they issued to the various Powers, the information vouchsafed as to the manufacture, import, and export of the drugs in question is very imperfect. In regard to cocaine the only countries in which the manufacture of that alkaloid is acknowledged are Japan and Switzerland. Germany and the United States had furnished no statistics. Great Britain is stated to import largely from Peru and to export chiefly to France and the Netherlands. Switzerland manufactured 732 kg. of cocaine in 1921 and received considerable imports from Germany and France. Japan manufactured 4,100 kg. of cocaine in 1920, and in the same year imported 3,500 kg., chiefly from the United States, but also from Switzerland, France, and Great Britain. "Enormous quantities of drugs," it is stated, "largely of European and American origin, have been reaching China from Japan during the last few years." A recent reply in the Commons stated that 643,985 oz. of morphine were manufactured in 1920 in England and some 322,484 oz. of morphine and heroin were exported in addition to exports by post.

All this serves to show that there is urgent need for the universal application of the International Opium Convention of 1912. That instrument was admittedly less stringent than was desired, largely to meet the objections raised by Germany, but its effective enforcement would do much towards restricting the drug traffic to legitimate channels. It is satisfactory to learn from Geneva that Switzerland is at last about to ratify the Convention, and a resolution has been adopted having for its object the refusal of producing countries to license exports of these drugs to countries which are not themselves enforcing the restrictions contemplated in the Convention.

THE LEGIBILITY OF PRINTED MATTER.

THE ever-increasing use of printed matter under all conditions of natural and artificial illumination makes the legibility of the print a matter of high importance. The comfort of the reader is involved, possibly even the integrity of the sight of school children and students, and there is the further consideration that illegible print may be misread. Mr. L. A. Legros has prepared a paper on this subject for the information of the Committee on Type Faces.[1] The committee is concerned primarily with government publications, but the information is of value at large. Mr. Legros's note extends to fifteen folio pages, and the type used is of the most beautiful and perfect kind; yet despite its fine fount of type the document is not comfortable to read. The printer has transgressed the first two rules of legibility: that the line should be of comfortable length, and that one line should be sufficiently separated from the succeeding. The lines of print are $6\frac{1}{8}$ inches wide, instead of the usual comfortable $4\frac{1}{2}$ inches of the textbook, and the descending tails of the letters of the upper line are only removed from the ascending limbs of the lower line by a fraction of a millimetre. The consequence is that the page appears as a general grey mass, and the task of following the lines in reading is so difficult as to make the appreciation of the meaning of the printed statements uncertain and perplexing. Strangely enough the two cardinal features of good print—reasonable length of line and the judicious use of "leads" between the lines—are each dealt with by the author in his paper, and an example to show the good effect of leading is given. Having noted this blemish we may say that the matter of the paper is an exceptionally careful statement of the characters of the several founts of type in common use, and their effect on legibility. In his analysis the author employs as many categories as require paragraphs from *a* to *w*; but not one of them is redundant. There are some fifty different varieties of founts, without considering "fancy faces" or scripts, and the author's endeavour has been to discover the defects of the chief of these. Certain letters hinder legibility. The small "i" is one of these; in certain combinations it goes to form words in which the dot causes confusion—for example, "toil" may be mistaken for "toll"; other words are clearer for the dot of the "i"—for example, "imminent." In former days a change for the better was the suppression of the long f-shaped "s" ordinarily used at the beginning and in the middle of words. This change was made experimentally in Bell's edition of *Shakspere*, 1787. Mr. Legros notes that the short "s" was rapidly adopted both in this country and on the Continent, but that the Oxford University Press did not make the change till 1824, and we might add that Dr. John Brown's *Horae Subsecivae* published in 1858 was printed throughout in the old way. Not only did the change increase legibility, but it reduced the number of types in the printer's case. The relative thickness of vertical and horizontal stroke is of importance. If the vertical stroke be much exaggerated, as is found in some French printing, legibility is impaired; again, overfineness of the horizontal line induces rapid wear of the type and loss of legibility.

[1] *A Note on the Legibility of Printed Matter prepared for the Information of the Committee on Type Faces.* By Lucien Alphonse Legros, O.B.E., M.Inst.C.E. London: H.M. Stationery Office. 1922. 1s. 6d. net.

Similarity between pairs of characters leads to confusion. The use of the serif (the fine cross-stroke at the top and bottom of a letter—a relic of the old penman's work) is carefully discussed. Plain characters without serifs are often used for display purposes, and for that reason some have been led to suppose that this gives greater legibility. The sans-serif letter strikes the eye, but is unpleasing in page form, and there is actually a certain loss of legibility when the serif is absent; thus the dotted "i" with the serif is more readily distinguishable from the "l" than when there are no serifs on either. Dissimiliarity of form is more important in figures: "3" and "5," "5" and "6" are very readily confused, as the users of a telephone directory know only too well. Much care has been expended in the past in deciding what is the best form of type, and the author agrees that the "modern" style is the best, and he confirms the observations of Babbage, who in the preface to his *Tables of Logarithms* of 1827 states that "the clearness of facility of reading does not depend on the size of the type alone, but on the proportion of the type to the interval between the lines," and "figures of the same, or nearly the same, height are preferable to those in which some of the digits rise above and others fall below the line, because they interfere with the space between the lines." The author gives two settings of a table from Bradshaw, one in modern, the other in old style figures, and the modern with its even row of figures is distinctly the more legible. The quality of the paper used and its colour and light-reflecting capacity are discussed; the colour of the ink and certain points in illumination are noted. Mr. Legros's pamphlet is of much interest, and will be of particular value to those engaged in editing and publishing; but to the general reader the report of the British Association Committee dealing with the print of school books will be the more useful.

AUTOGENOUS VACCINES.

IN an article based on much practical experience Parisot and Simonin[1] of Nancy review the present position of autogenous vaccines, and specially consider the reasons why this form of treatment, though logically the correct one, has not been crowned with the success that might have been anticipated. Thus it is mainly in chronic staphylococcic infections that good results have been obtained, and even these are not constant, and are often less satisfactory than those given in response to stock vaccines; then, again, most striking cures have followed the almost haphazard employment of vaccines, sometimes even composed of micro-organisms other than those responsible for the disease. It has therefore been thought that it is unnecessary to take the time and trouble involved in the preparation of an autogenous vaccine when almost any vaccine will give equally good results. The reasons for this erroneous opinion are fully considered; as P. Delbet, Beauvy, and Girode pointed out in 1914 in connexion with the vaccine treatment of local surgical lesions, two very different effects may follow the injection of a vaccine: there is an immediate non-specific reaction, due to colloidoclasic or protein shock, which accounts for the remarkable successes of vaccines in some acute infections; and secondly, a delayed reaction due to the specific action of the microbes contained in the vaccine. It is therefore important to distinguish between bacterial protein shock and vaccine treatment, and to refer correctly to each of these factors the good and bad effects that may occur after the injection of a vaccine. The mistakes and considerable difficulties in the technique of the preparation and administration of autogenous vaccines have been responsible for much of the failure of autogenous vaccines. Parisot and Simonin, therefore, after describing the details of making an autogenous vaccine, indicate the fallacies that may arise, such as failure to cultivate the responsible micro-organism from the use of an unsuitable medium, the difficulty of choice, and the changing character of the microbes in mixed infections, and draw attention to the importance of avoiding too high a temperature in sterilizing the cultures, and to the deterioration of vaccines on keeping. The administration of the vaccine demands meticulous care and a close watch over the reactions of the patient, so as to give the proper doses at the appropriate intervals and to suspend further treatment when contraindications appear. If vaccines are given without this care serious and even grave accidents may occur; among these is protein shock, which, though it may be beneficial, is not part of, or necessarily favourable in, vaccine therapy. It is therefore advisable that the vaccine should consist of carefully washed micro-organisms, thus excluding the complex products of the culture medium. An excessive reaction, especially at the site of the injection, where considerable increase in the inflammation and swelling occurs, is often due to a transient state of diminished resistance, corresponding to Sir Almroth Wright's negative phase; in these circumstances another injection of vaccine, if given prematurely, may induce severe symptoms, and, although the vaccine is perfectly sterile, give rise to a fixation abscess at the site of injection. On the other hand, a certain amount of increased activity and exudation in the infected focus, not only at the outset of treatment, but also after several injections have been well borne, is a favourable sign. Thus in chronic gleet and pulmonary suppuration the first evidence of improvement may be ushered in by increased secretion of mucus, and in cutaneous staphylococcic infections there may, after a number of doses of an autogenous vaccine, be a sudden outburst of small pustules around the original focus, which rapidly disappear and are followed by improvement. Sometimes the fourth or fifth dose of the vaccine is followed by phlegmonous infiltration without fever around the site of the injection; this is Arthus's phenomenon due to local anaphylaxis. The authors are definitely of opinion that except in those that run a rapid course all infections, acute or chronic, local or generalized, can be benefited by autogenous vaccine treatment.

[1] Paris, t, J., et Simonin, P.: *Rev. de méd.*, Paris, 1922, xxxix, 392-423.

MEDICAL EDUCATION IN THE UNITED STATES: TWENTY-ONE YEARS' PROGRESS.

THE Educational Number of the *Journal of the American Medical Association* (published on August 19th) contains the usual statistics of medical education in the United States; also a leading article concisely reviewing the progress made during the twenty-one years that have passed since our contemporary first published these tables. It was in 1901 that the American Medical Association opened its campaign for the bettering of medical education in the United States. Many of the 159 medical colleges whose names appeared in the first list were known to be joint-stock corporations, conducted largely for the profit of their owners. At that time (the *Journal* says) "no one, in fact, knew just how serious conditions in the medical schools actually were. Sectarian medicine was at its zenith, with 22 homoeopathic and 10 eclectic colleges." In order to centralize the efforts towards reform a permanent committee of the Association—the Council on Medical Education—was set up in 1904, and one of its earliest acts was to take over the business of collecting and tabulating statistics relating to medical education. When the Council made its first tour of inspection in 1906 the United States had more medical schools than all the rest of the world put together, and, with a few notable exceptions, the standard of general and professional education in American medical schools was much lower than that in Europe. The task of discouraging the worse kind of school and stimulating the better went on steadily from year to year. Side by side with this a policy of amalgamation was urged upon locally competing institutions. By 1917 great progress had been made; the total number of schools had fallen to 95, and—more important still—the number of higher grade schools had grown from 4 to 86. There are now 81 medical schools in the United States, of which 74 require of their students before admission "two or more years of college work." During the period under review the total number of medical students has diminished by something like 40 per cent., while the proportion of students in well-equipped medical colleges

has grown from 3.9 per cent. of the whole to 96.1 per cent Moreover, of last year's total of 2,529 medical graduates, 1,455 had also obtained degrees in arts or science. This remarkable progress in bringing medical education throughout the United States into line with the standards laid down in other leading countries must be looked upon as one of the most important achievements of the American Medical Association.

NATURAL SCIENCE AND THE CAMERA.

THE Royal Photographic Society of Great Britain is holding its sixty-seventh annual exhibition at the galleries of the society, 35, Russell Square, W.C., from September 18th to October 28th. During the period of the exhibition lantern lectures will be given every Tuesday and Friday at 8 p.m. The photographs are grouped under various sections. In the natural history section there are many interesting pictures of birds and animals photographed in their natural haunts. Thus Mr. M. Maxwell snapped an African wild bull elephant at the distance of eight yards, probably the closest range at which this has ever been done. He also exhibits a photograph of giraffes at full gallop, travelling about thirty miles an hour. Other pictures show birds feeding their young or nesting, a meadow pipit feeding a young cuckoo, a jackdaw with an insect flying to the food at the bird's feet, and many plants, moths, and butterflies. The medal in this section is awarded to Mr. Ralph Chislett for a photograph of variations in the plumage of the Arctic skua. The section of pictorial photography contains numerous artistic productions, many of which approach in their effect the art of painting, and suggest that photography stands to this art very much in the same position as the mechanical piano-player stands to music. Some good portraits are shown, among them being those of the Archbishop of York and of the American divine who is said to address each week (in paragraphs of italic type) a congregation of thirteen million syndicated newspaper readers. The scientific section contains work of more interest to the medical man, although the purely medical productions are not very numerous. Some thirty or forty radiographs are shown, and in this department Mr. A. O. Forder wins the medal with a picture of a sarcoma of the femur. A lateral view of a head shows a piece of shell in the sphenoidal sinus; and this radiograph, together with a further series, displays the merits of the Bucky-Potter diaphragm. Amongst the radiographic negatives shown by Mr. N. E. Luboshez is one of a fish that had swallowed a whelk; both the thick and thin portions of the fish are well shown, and the details of the whelk's shell are very clear. Dr. G. H. Rodman shows several series of photomicrographs of animal and plant hairs, of the under surface of the leaf of the goosefoot, and of a horizontal section of the human scalp. The astronomical and aerial prints, many of them contributed by the Royal Observatory, the Dominion Astrophysical Observatory, and the Mount Wilson Observatory, are interesting. This section also contains examples of technical applications of photography; for instance, a Russian internal passport, which had been fraudulently used by no less than four persons; photographs from aeroplanes; pictures of bullets perforating plaster-of-Paris partitions or soap bubbles. Two cabinets of colour transparencies containing a number of slides illustrating the application of the autochrome process to stereoscopic work are very attractive. The exhibition is open daily, except on Sunday, from 11 a.m. to 9 p.m. Admission is free.

THE ADVANCEMENT OF SCIENCE, 1922.

WITH customary promptness the addresses delivered at the ninetieth annual meeting of the British Association at Hull, which closed on September 13th, have been issued in book form with an orange-coloured paper cover, under the general heading, *The Advancement of Science, 1922*.[1] When the first meeting of the Association took place at York in 1831 printing and publishing methods were more leisurely, we believe. The volume opens with the full text of Sir Charles Sherrington's inaugural presidential address to the Association on "Some aspects of animal mechanism," of which an abstract appeared in our issue of September 9th (p. 485). This is followed by the text of the addresses given by the presidents of the thirteen Sections, arranged in the alphabetical order laid down in the programme of the meeting. The names of the Sections and their presidents and the titles of the addresses are as follows:—*A*. Mathematics and Physics: Professor G. H. Hardy, "The theory of numbers." *B*. Chemistry: Principal J. C. Irvine, Part I, "The organization of research"; Part II, "Some research problems in the carbohydrates." *C*. Geology: Professor P. F. Kendall, "The physiology of the coal swamps." *D*. Zoology: Dr. E. J. Allen, "The progression of life in the sea." *E*. Geography: Dr. Marion Newbigin, "Human geography: first principles and some applications." *F*. Economic Science and Statistics: Professor F. Y. Edgeworth, "Equal pay to men and women for equal work." *G*. Engineering: Professor T. Hudson Beare, "Railway problems of Australia." *H*. Anthropology: Mr. H. J. E. Peake, "The study of man." *I*. Physiology: Professor E. P. Cathcart, "The efficiency of man and the factors which influence it" (an abstract appeared in our last issue at p. 524). *J*. Psychology: Dr. C. S. Myers, "The influence of the late W. H. R. Rivers (President-elect of this Section) on the development of psychology in Great Britain." *K*. Botany: Professor H. H. Dixon, "Transport of organic substances in plants." *L*. Educational Science: Sir Richard Gregory, "Educational and school science." *M*. Agriculture: Lord Bledisloe, "The proper position of the landowner in relation to the agricultural industry." The general reader, taking modest sips in this symposium of science, would perhaps feel more at his ease if the pages of the volume were numbered consecutively.

[1] London: John Murray, pp. 252. 6s. net.

INDUSTRIAL STATISTICS AND HEALTH.

THE members of the third annual Industrial Welfare Conference, held at Balliol College, Oxford, were addressed, on September 18th, by Dr. H. M. Vernon, who has carried out many investigations for the Industrial Fatigue Board. His subject was the importance of keeping records and statistics. He pointed out that a system of efficient records and statistics was an integral part in the new ideas of industrial management which were to-day steadily gaining ground. The elimination of waste in industrial establishments was bound to prove eventually of benefit to all concerned, and those responsible for the welfare side of large firms had opportunities for collecting valuable statistical information which no other persons attached to a factory possessed. Those particulars were, however, often wasted because welfare supervisors failed to recognize the importance of keeping the requisite records. In regard to the question of labour turnover there was good reason to believe that this amounted to as much as 100 per cent. in a year. This meant a huge loss to the employers, who had the expense of training new workers, and also to the employees, who earned low wages while they were on a new job. A good knowledge of the degree of ill health in the workers and its variations could be obtained by keeping "lost time" records, especially if the time lost from sickness was separated from that due to other unavoidable causes. Accidents and injuries formed one of the chief causes of lost time; hence an accurate record of all accidents treated should be kept and should be examined statistically. The records might show that some accidents were especially frequent among workers on some particular type of machine or process, or they might show a rise brought on by fatigue during overtime work. Again, it was well known that inexperienced workers were peculiarly liable to accidents unless special precautions were taken. The effects of an accident prevention campaign should always be tested statistically. It was important also to determine whether any given workshop conditions favoured the maximum degree of health and efficiency in the workers. Dr. Vernon held that the proper person to do this was the supervisor, by keeping exact records of the temperature of the workshops and of the degree of ventilation.

NAVAL MEDICAL WAR MEMORIALS.

THE memorial tablet designed for the Royal Naval Hospital at Plymouth, commemorating the names of those naval medical officers and members of the nursing staff who lost their lives in the war, will be unveiled on Wednesday, October 4th, at 3 p.m. As already announced in these columns, a tablet was unveiled at the Royal Naval Hospital, Haslar, on August 17th, and a similar tablet will be erected at the Royal Naval Hospital at Chatham at a later date, which will be notified. The Medical Director-General, R.N., requests us to state that the relatives and friends of the fallen and all others who may be interested are invited to attend the unveiling ceremony at the Royal Naval Hospital, Plymouth, or at Chatham, whichever may be more convenient for them.

THE Royal National Orthopaedic Hospital (Great Portland Street) has established a country branch hospital at Brockley Hill, Stanmore, in the premises formerly known as the Mary Wardell Convalescent Home and used during the war as an auxiliary military hospital. The object of the new country branch is to give the benefits of open-air treatment and heliotherapy to patients suffering from deformities, by far the greater number of these being children. In most cases the whole of the treatment, including operation, is carried out there. On September 21st the Earl of Denbigh, Chairman of the Royal National Orthopaedic Hospital, received a party of visitors at the country branch, and gave them an opportunity of inspecting the house and grounds and the methods of treatment.

THE report for 1921–22 of the Insurance Acts Committee is printed in full in the SUPPLEMENT this week. It will be presented formally to the annual conference of representatives of Local Medical and Panel Committees to be held in the Central Hall, Westminster, at 10 a.m. on Friday, October 20th.

THE JOHN ELLIOTT MEMORIAL LABORATORY.

OPENING CEREMONY AT CHESTER ROYAL INFIRMARY.

THE John Elliott Memorial Pathological and Bacteriological Laboratory at the Chester Royal Infirmary has been equipped by public subscription in memory of the late John Elliott, M.D., F.R.C.P., who was honorary physician to that institution from 1895 to 1921 and one of the leading consultants in the county.

The laboratory was opened on the afternoon of September 16th by Sir Humphry Rolleston, K.C.B., M.D., D.C.L., LL.D., President of the Royal College of Physicians of London and Emeritus Physician to St. George's Hospital. On arrival at the Infirmary Sir Humphry Rolleston was met by the chairman of the board (Mr. E. M. Sneyd Kynnersley) and members of the honorary medical staff, and was conducted to the laboratory. Among the subscribers to the memorial present were the Bishop of Chester (the Right Rev. Luke Paget, D.D.), Dr. Willoughby Gardner of Shrewsbury, and Mr. G. P. Newbolt of Liverpool. Tea was served in an adjoining ward before the opening ceremony.

Sir Humphry Rolleston's Address.

The title of Sir Humphry Rolleston's address was "The clinical laboratory in the modern hospital." He began by remarking on the appropriateness of perpetuating the memory of a physician such as John Elliott by the addition of a pathological and bacteriological laboratory to the institution, on behalf of which he did yeoman service for twenty-six years. This modern laboratory corresponded well with the operating theatre recently erected as a tribute to the late James Taylor, for forty years a mainstay and ornament of the surgical staff of the infirmary. Originally opened in 1756, and much extended within the last few years, the Chester Royal Infirmary had a proud record of work and workers in the past.

But the modern developments of medicine entailed fresh methods, so that for the efficiency of a present-day hospital a well equipped and staffed laboratory was, like a radiological department, as integral a part as the dispensary and theatre. It was no doubt true that when any new phase or fashion appeared a danger arose of rushing to extremes. Before the era of bacteriology and clinical laboratories the medical man had to depend entirely on his own powers of observation, which were therefore cultivated to a high pitch of excellence, and clinical instinct—the subconscious judgement born of years of thoughtful experience—was a great asset to the medical practitioners of all time, of the present no less than of the past. The inestimable value of the laboratory, with its rapid decision of clinically doubtful diagnoses, was now established beyond question; but it must be admitted that some who had grown up with it might be tempted to rely solely on its verdict, and so to save themselves the trouble of investigating the patient. In this way fallacies and mistakes might arise, for the old adage that the patient and not the disease must be treated should not be forgotten. Against the danger of neglecting investigation of symptoms Sir James Mackenzie had uttered many wise warnings, and was setting an example in his Institute for Clinical Research at St. Andrews. The clinical laboratory, while an essential part of a complete hospital, must be closely co-ordinated with the wards, for only by their intimate association could the best results be obtained.

The laboratory met a large and ever-growing demand from the wards and out-patient rooms, and should therefore be competent to deal with all branches of pathology. How extensively this subject had grown, and into how many special branches pathology had become differentiated, was shown by the staffing of the laboratories at the larger medical schools; in fact one man could not satisfactorily cover the ground of morbid anatomy and histology, bacteriology, serology, biochemistry, clinical and experimental pathology, any more than a clinician could be thoroughly efficient in all the specialties of medicine. In hospitals without a medical school the conditions were rather different and the demands less; yet they were so considerable that they should be met by the appointment of an adequately salaried full-time director, with co-workers (one of whom should be a biochemist) and trained laboratory attendants. The other workers, except perhaps the biochemist, would be part-timers, and might be junior members of the hospital staff, for the experience thus gained would greatly increase their professional efficiency, and their presence would ensure continuous active correlation and sympathy between the wards and the laboratory.

Sir Humphry Rolleston then summarized the value of such a laboratory as this. The clinical laboratory was an advantage to the community by providing means for early detection of the nature of infections, and so preventing the spread of disease. It was of value to the individual patient by aiding diagnosis and checking the administration of modern methods of treatment. From the point of view of the medical profession such laboratories formed a centre of medical work and activity. Without this assistance a medical man in his fight against disease was like a pugilist with one arm tied behind his back. The laboratory and hospital gave him opportunities for utilizing the methods he learnt as a student and for acquiring knowledge of the progress of medicine. Deprived of this the medical man must deteriorate in value and his patients suffer accordingly. Complete co-ordination of the medical profession for the prevention of disease required a close association of the laboratories of towns and districts with the local hospitals. In every direction internal medicine depended on laboratory assistance. The surgeon, too, depended on the laboratory for aid in diagnosis and prognosis, for guidance in dealing with the problem when to operate and when to hold his hand, and for many points in the treatment of his cases. The laboratory formed a centre of research to which the profession looked for additions to medical knowledge. The expenses of the laboratory should be regarded as an insurance against epidemic outbreaks of disease both outside and inside the hospital, and so as an eventual economy.

In conclusion, Sir Humphry Rolleston gave a brief sketch of Dr. Elliott's career, remarking that the tribute paid to his memory that day was one that John Elliott would have appreciated most highly. He recalled that Elliott and he entered as students at St. Bartholomew's Hospital on the same day.

"Not only was he exceptionally able, but he had the faculty—not always found with such intellectual gifts—of doing everything to which he turned his hand with the might that ensured success. The field of his activities was wide both in the strictly professional subjects and in science; a first-class general physician, he had a well-equipped laboratory of his own for the elucidation of his cases, thus realizing the ideal of present-day medicine in the investigation of morbid function; he was much interested in radiology, played an active part in the treatment of venereal disease, and, as recently as 1921, formulated precautions necessary

in the administration of salvarsan. His work for the Infirmary went far beyond the discharge of a physician's duties, for he was the driving force in the initiation and execution of the important additions and improvements of ten years ago."

The vote of thanks to Sir Humphry Rolleston was proposed by Dr. J. G. Taylor, senior physician, and seconded by Mr. W. H. Dobie, consulting surgeon to the Infirmary. After the address the laboratory and the rest of the Infirmary were open for inspection. The newly appointed honorary pathologist and assistant physician to the institution is Dr. W. H. Grace, recently of Guy's Hospital.

THE HEALTH OF LONDON IN 1921.

THE annual report on public health to the London County Council,[1] by Dr. W. H. Hamer, has recently been issued, and keeps up to the high standard which this long series of reports has attained. In contrast with 1916, "in which, in a literal and perhaps in a metaphorical sense also, more water than ever before known flowed under London Bridge," 1921 was a year of excessive drought, and June was actually the driest month ever known in the London area. In other respects last year was exceptional—for example, while unemployment had risen to 10 per cent. by the end of March, the coal strike then began, and by the end of June unemployment reached 23 per cent., an unprecedented figure.

Vital Statistics.

The population of the County of London at the census of June, 1921, was 4,483,249, or 38,436 less than at the census of 1911. The census showed that the decentralization of the population, which began some twenty or thirty years ago, still continues, and in the principal areas in which buildings have been replaced by commercial premises—the City of London, Holborn, Finsbury, Stepney, Westminster, and St. Marylebone—there was a decrease in population of over 87,000 between 1911 and 1921, about the same number as in the previous decennium. The approximate marriage rate was 19.5 per 1,000 of population, which was only slightly above the average of the last seventy years. There were 99,839 births, equal to a rate of 22.1 per 1,000 of population, which showed a substantial decline upon that of the preceding year, and was below the level to which it had fallen just before the war. The greatest decrease in the births as compared with the previous year occurred in the poorer populations, varying from 22 per cent. in Bethnal Green to 12 per cent. in Stoke Newington. The deaths numbered 56,259, the mortality per 1,000 living being 12.5, as compared with 12.6 in 1920; this is the lowest death rate recorded in London. With regard to the death rate, it may be observed that although the population has remained practically stationary during the past twenty years so far as the actual number is concerned, its constitution has undergone considerable change. London attracts young adults of both sexes, and owing to the changing constitution of its population the death rate does not measure the risk of life in London. About 70 per cent. of the population of London in 1911 were born in the country—that is to say, about one and a half millions were immigrants. The infant mortality was 81 per 1,000 births, as compared with 76 and 85 in 1920 and 1919 respectively. With the striking exception of diarrhoea, there was a decline in the mortality from most of the principal causes of infant deaths. Only two cases of small-pox occurred in London during 1921, neither of which proved fatal.

Scarlet Fever, Diphtheria, and Measles.

The deaths from scarlet fever and diphtheria were more numerous in 1921 than in previous years owing to the exceptionally high prevalence of these diseases. There were 32,738 cases of scarlet fever in London during the year, as compared with 22,705 in the preceding year, and the deaths numbered 292. The number of cases occurring during the first quarter of the year was very much in excess of the average for the quarter. The number of cases of diphtheria notified was 16,319, as compared with 13,780 in 1920; the deaths during the year were 1,150, the corresponding figure for 1920 being 1,023. The number of cases of diphtheria in London last year exceeded that in any other year since 1890, when notification of the disease became compulsory. The deaths from measles numbered 244, as compared with 1,016 in 1920. The mortality was 0.05 per 1,000 living, the lowest rate recorded in London.

[1] No. 2168. P. S. King and Son, Ltd., or through any bookseller. 2s. 6d.

Diarrhoea and Enteritis.

There were 2,152 deaths among children under 2 years of age from diarrhoea and enteritis, giving a mortality per 1,000 births of 21.55; this rate is in excess of that for the four preceding years, but a trifle below the average for the ten years 1911–20. In view of the high average temperature of the summer the mortality from infantile diarrhoea was, in fact, remarkably low.

On investigating the figures for the thirty-eight years up to 1914 the calculated deaths are (Dr. Hamer states) in very close agreement with the numbers recorded; this agreement is indeed remarkable when regard is had to changes in classification which occurred in the course of the period, more especially late in the nineties. In 1914 and subsequent years there is a remarkable difference between the actual and estimated mortality, and as this takes in the whole of the war period the probability that the conditions brought about by the war have been responsible for the reduced mortality at once suggests itself. There is, however, some indication that the change which appears at first sight to have occurred abruptly in 1914 is really foreshadowed some years earlier. Up to 1905 the actual deaths are sometimes below and sometimes above the number calculated from the temperature; but after 1905, with the exception of 1913, the calculated deaths always exceed the actual number, and the excess in 1921 (a wet summer) was actually greater than in 1914. Again, the excess in 1914 can scarcely be attributed to war conditions in any large measure, even taking into account the fact that most of the deaths occurred in September; in the earlier months of the war there was no scarcity of food, and therefore no great change of diet affecting infants, although the immediate increase in the price of sugar may not have been without its effect upon the feeding of children of the poorest classes. The period 1916–19 is that in which the effects of the war would be expected to be most apparent, and although the divergence of the calculated from the actual mortality in this period is very conspicuous, it is just as apparent in the two succeeding years. There is no doubt that the separation allowances made during the war, combined with the rationing of food, improved the quality and also even the quantity of food supply of the very poor—of the class, that is, in which the mortality from infantile diarrhoeas is greatest. In addition there have been special administrative measures, directed to the care of expectant and nursing mothers, as well as of their infants; these were inaugurated before the war, and were further developed in spite of war conditions. Over and above these direct influences upon child welfare, there is the effect of the introduction of national insurance in bringing the practitioner into closer relations with the homes of the poor.

It is suggested that a possible explanation of the decrease in summer diarrhoea mortality in recent years is the replacement of horse traction by machine traction, and the resulting decrease in the amount of horse manure.

Enteric Fever.

During 1921, 329 cases of enteric fever were notified in London, as compared with 387 in 1920; the deaths numbered 60, as against 48 in 1920. Of the total cases notified 193 were admitted to hospitals of the Metropolitan Asylums Board, and of these it was found that 82, or 42.5 per cent., were not typhoid fever. Of the 60 deaths occurring in London 14 were inmates of county asylums outside the county boundary, and as the cases occurring in these institutions are not notifiable in London the deaths comparable with the notifications become reduced to 46. In the 50 cases in respect of which confirmatory bacteriological results were obtained, the presence of *B. typhosus* was shown in 7 cases, 25 were described as "paratyphoid," while 6 were described more specifically as paratyphoid A and 12 as paratyphoid B. Of the 172 cases in which a possible source of infection was mentioned, the disease was described in 30 to shellfish, in 20 to fish, in 10 to watercress, and in 23 to other food; infection was attributed in 31 cases to contact with other cases. Dr. Hamer states that the practical issue with regard to typhoid fever which presses for decision at the present time is whether the control over the spread of this disease is to be maintained and further strengthened by working on the epidemiological lines (first laid down by Dr. Bulstrode in his classical oyster report of 1896) or on rival bacteriological lines, in compliance with which the stress is laid on the supposed risk from healthy carriers and the need of combating this by vaccination. It has been suggested that the mischief responsible for typhoid fever in London, during at any rate the last twenty-five years, could be traced to remote estuaries and distant foreshores, and that full control of the disease is to be secured by cutting off polluted supplies of fish and shellfish, and not by attempting to segregate healthy carriers of bacilli or advocating the general practice of antityphoid vaccination.

Influenza.

During the severe epidemic of influenza which occurred practically throughout Europe towards the end of 1921 London was attacked towards the latter half of December, about a month later than the beginning of the epidemic in the Midlands; in fact, so far as can be judged from the mortality returns, influenza became epidemic in Yorkshire earlier in 1921 than in any of the principal cities on the Continent. During the course of the epidemic about 2,200 deaths in London were attributed to influenza, and taking into account deaths from complications it is estimated that not less than 5,000 deaths were caused in the London area by the epidemic. The contrast is remarkable between the age incidence of mortality in the epidemic of 1919 and in that of 1921; in the earlier epidemic the maximum mortality occurred at the ages between 25 and 35, but in the epidemic of 1921–22 the age of highest mortality was between 65 and 75, as in the epidemics of the nineties. According to the records of school attendance the number of children attacked in the last epidemic was greater than in the winter epidemic of 1919.

Encephalitis Lethargica.

During 1921 there were 243 cases of encephalitis lethargica notified, of which 87 were notified during January and 50 in February. The disease had already begun to increase in prevalence in December, 1920, and reached its climax in January, 1921. Of the 243 cases notified 45 proved not to be genuine cases, and in 9 others the diagnosis was considered to be doubtful; two further cases were recorded, but were not notified officially. Of the 191 actual cases 60 (or 31 per cent.) proved fatal.

Tuberculosis.

The death rate from pulmonary tuberculosis during the year was 1.07 per 1,000 living; the deaths numbered 4,813, as compared with 4,675 in 1920. The number of primary cases of tuberculosis notified was 12,214, as against 13,163 in 1920; of these 10,015 were pulmonary and 2,199 were other forms of tuberculosis. At ages 10 to 15 the female pulmonary cases exceeded the male by 51, or 31 per cent., but the contrast between the sexes at this age in the mortality is even greater than in the cases, the excess being 150 per cent. during the year. The National Insurance Act, 1920, provided for the discontinuance of sanatorium benefit, and by the combined operation of this Act and the Public Health (Tuberculosis) Act, 1921, the responsibility for the institutional treatment of tuberculous insured persons was transferred, as from May 1st, 1921, from the Insurance Committees to the local authorities responsible for the institutional treatment of the remainder of the population. Becoming thus responsible for the residential treatment of tuberculous persons in the metropolis the London County Council has taken steps to ensure that the best possible use is made of all existing accommodation. The number of cases requiring residential treatment has also been reduced to a minimum. It has been the policy of the Council to take advantage of all suitable accommodation already provided by hospital and sanatorium authorities, including the Metropolitan Asylums Board, and to take advantage also of additional suitable accommodation which such authorities provide by arrangement with the Council. The improved method of selecting cases for residential treatment depends upon the provision of observation beds which have been reserved at the Brompton and Victoria Park chest hospitals. The dispensary system described in last year's report has been further developed.

Venereal Diseases.

It was decided in March, 1921, to continue the scheme in force since the beginning of 1917 for the diagnosis and treatment of venereal diseases, in accordance with which the Council joined with neighbouring county councils and county boroughs to utilize the facilities afforded by certain London hospitals for diagnosis and treatment and to provide laboratory facilities for aid in diagnosis and treatment. Arrangements were made for free treatment and diagnosis at twenty-eight hospitals and for the reception of patients for treatment at nine hostels; special provision was made for the treatment of pregnant women and very young children. During 1921 19,216 London patients attended at the hospitals for the first time, a decrease of over 4,000 from the previous year. At the end of the year there were 332 medical practitioners on the approved list (considerably more than in the previous year), and they sent 15,395 pathological specimens for examination during 1921.

THE WELFARE OF THE BLIND.

WE have received three prints of recent issue which give an excellent survey of the various activities now in being for the care of the blind, particularly in relation to State responsibility.

THE REPORT OF THE ADVISORY COMMITTEE.

The Advisory Committee on the Welfare of the Blind, a committee of the Ministry of Health, has issued its third annual report, for the year 1921–22.[1] The Committee exists "to advise the Ministry on matters relating to the care and supervision of the blind, including any question that may be specially referred to them by the Minister." Since the issue of the last report the Blind Persons Act of 1920 has come into force. Section 1 of that Act provides for the grant of pensions to blind persons between the ages of 50 and 70 at the same rates and conditions as old age pensions, and it is reported that up to the end of March of this year 9,197 persons in England and Wales between those ages were in receipt of pensions. It is held that this provision has done much to alleviate the distress previously common among the blind of the unemployable class.

Section 2 of the Act imposes the duty on county and county borough councils to promote the welfare of blind persons ordinarily resident in their area, and for this purpose to provide and maintain or contribute towards the provision and maintenance of workshops, hostels, homes, and other places for the reception of blind persons, or to do any other thing approved by the Minister for promoting the welfare of the blind. It is reported that the majority of the local authorities have submitted schemes as required by this section, and that with a few exceptions it is anticipated that all schemes will be in operation during the present year. The Committee is emphatically of opinion that the best interests of the blind themselves will be served by the continuance and fostering of the voluntary side of the work, and it notes with pleasure that this is the declared policy of the Ministry. It also unanimously approves the principle that where outdoor Poor Law relief is given to the blind it should be administered under suitable arrangements through the local institution for the blind, and it recommends this principle for general adoption. Section 3 of the Act regulated the appeal by voluntary societies for subscriptions, in much the same fashion that war charities were regulated.

The Committee has been asked whether it is desirable that local authorities should themselves establish and conduct workshops for the blind as municipal undertakings. It prefers fostering the voluntary side of this work, and views the municipalization of the trading activities of the blind with a certain amount of anxiety.

> "In our opinion all workshops for the blind should, as far as possible, be conducted on a proper economic basis, and it seems to us that municipalization may destroy this basis, with unfortunate effects on the morale and efficiency of the workers."

In connexion with the education of blind children, considerable alarm was felt on the issue of a circular letter by the Board of Education in January, 1922, intimating that the grants for this purpose could not exceed those of the preceding year. It is now stated that the Board has intimated to the local authorities that it will not now have to place any restriction on the full use of the accommodation already recognized. The blind workers are at an economic disadvantage, and much care has been given to the measures that should be undertaken to augment earnings without reducing the stimulus to work which earning gives. The Committee has arrived at a sliding scheme whereby the wages of workshop employees should be augmented on a sliding scale, providing for a maximum grant of 15s. a week on earnings up to 10s. a week, at standard rates of pay, decreasing by 3d. in the shilling to a minimum of 5s. a week augmentation where the wages are 50s. a week or more. The Minister has recommended this scale to the consideration of the local authorities.

Attention has been given to home workers, and an interesting departure on the part of the Birmingham Institution is reported. A travelling motor shop for the sale of goods made by the home workers visits the various markets within the area, with the result that more work has been found for these workers. Comment is made on the conditions of the grant that may have been received by the home workers, and the view is expressed that there may result some hardship unless

[1] *Third Annual Report of the Advisory Committee on the Welfare of the Blind to the Ministry of Health.* 1921–22. H.M. Stationery Office. 6d. net.

these be varied. Steps are being taken to improve the service rendered by the home teachers of the blind. This service is regarded as one of the utmost importance in ministering to the general social well-being of the bulk of the blind population. The scheme for the certification of these teachers has gone so far that the Committee now recommends that it would be desirable to require all home teachers appointed, on such future date as may be determined, to undergo the examination and obtain the certificate.

The number of blind persons now on the register kept by the Committee has increased from 30,785 in 1920 to 34,894 in 1921. The increase is held to be accounted for by two conditions: first, the more complete records obtained, and secondly, the finding of old blind persons owing to granting of pensions. It is not thought that the actual number of the blind has increased. The number of mentally defective amongst the blind adds to the difficulty of suitable provision. It is estimated that 40 per 1,000 are mentally defective, as compared with 8 per 1,000 amongst the ordinary seeing population. It had been hoped that the local authorities under the Mental Deficiency Act, 1913, would have been able to utilize their powers by combining to make some special provision for these persons, but the restrictions placed upon them in administering the Act by the Board of Control have rendered such assistance impossible up to the present. The Committee is making investigations into the matter, and proposes to report further. It is reported that there is need for the provision of a special home for chronically infirm blind, and that there is room for a voluntary agency to undertake this work.

The report concludes with a series of tables giving the location of the blind, the work carried on by them, the number of unemployed, unemployable, and mentally defective. The chairman of the Committee is the Right Hon. G. H. Roberts, a Labour M.P., and the personnel number 18, all of whom are representatives of county, municipal, and Poor Law associations and of voluntary agencies for the blind.

THE LABOUR PARTY'S PAMPHLET.

In contrast with this report of work done, which is of a very hopeful character, there may be read a pamphlet issued by the Labour party, entitled *The Blind Persons Act, 1920*.[2] It is a blunt and wholesale accusation against the Government and its Ministries of deliberately shirking the responsibilities placed upon them by the Act for the welfare of the blind. The reason for this attitude on the part of the Labour party is not far to seek. The pamphlet begins by setting out a lengthy resolution passed at the Cardiff Trades Union Congress, the last clause of which reads:

> "Notwithstanding anything which may be done to ameliorate the bad conditions of life and labour for the blind by Acts and clauses, which are mere palliatives, this Congress is resolved upon the principle of direct and complete State and municipal responsibility, and the elimination of the necessity for voluntary charity for the blind."

Thus we find there is a clear issue between the parties who report on the blind. The committee of independent persons who are at the same time actively engaged in the welfare of the blind believe in voluntary effort; the Labour party repudiate voluntary effort and desire that "the State" should take over the whole work directly.

The pamphlet has its uses: it contains a useful summary of work recently done for the blind and the ideas put forward by various agencies and associations, although the statements are a little spoiled by political propaganda sandwiched between. The point of the pamphlet is to be found in two paragraphs:

> "It is already clear that in many cases there is grave dissatisfaction with the way in which the Act is being worked. It is said that local authorities are proving very lax in their duties under the Act, that the Ministry of Health is anything but eager to help, and that the benefits which have accrued to blind persons so far under the Act are very small."
>
> "Although the Act was passed as a result of the failure and inadequacy of voluntary institutions the Ministry is attempting to force local authorities to work the Act entirely through such agencies. Capital expenditure has been prohibited, and in areas where there is no voluntary institutions the effect is practically to force such organizations into existence."

Some of the statements of the pamphlet are inaccurate.

> "The school accommodation for blind children remains hopelessly inadequate, and the voluntary agencies are quite incapable of providing a remedy."

The inference is that all schools for blind children are voluntary agencies, which is not true; and that such voluntary schools as exist are incapable, which is equally untrue. It would be well if the sponsors of the paper visited some of these schools; there are a dozen in London within a bus ride of Eccleston Square. Again, it is stated that the "economy" circular of January of 1922 is still in force, but that, we are informed, is not so. There are some appendices, one of statistics taken from last year's report of the Advisory Committee, and a copy of the Birmingham Scheme in operation under the Act of 1920. Presumably this scheme is cited as a model, yet we find that it provides for the full use of the local voluntary institution, and other voluntary institutions set up by the National Institute for the Blind, in the assistance of blind persons, both children and adults. Truly the citation of this scheme is better than the damnatory clauses of the pamphlet.

THE NATIONAL INSTITUTE FOR THE BLIND.

By way of affording some criterion of the value of voluntary work we may give a short summary of the work of the National Institute for the Blind, which has just issued its report for the year ending March, 1922.[3] This Institute was described in the JOURNAL in 1914, the date of the opening of the new premises in Great Portland Street, London, as "the University of the Blind," and it well merits the name, for there is scarcely a feature of the life of the blind which it does not touch. It is now not only the largest institution of its kind in the United Kingdom, but throughout the world. During the past year it collected and administered funds to the amount of £324,000—no small revenue. The account of the manner in which this sum was dealt with is given in a crisp, terse document of 39 pages, including the several statements of account. The Institute is rapidly becoming the foster parent of many other societies for the blind; it collects money and distributes it to the smaller societies, and in so doing it helps to co-ordinate activities and prevent overlapping of effort. In this manner some hundred thousand pounds were distributed last year.

The Institute has founded and maintains Sunshine House for blind babies, particularly for those whose homes are unsatisfactory. The present home is in Herts, and it hopes to establish one for the north of England shortly. It maintains two first-class colleges for the blind, that at Worcester for boys and that at Chorley Wood for girls. The value of these colleges cannot be overestimated, for they provide a public school education of the best type—a most necessary provision for the blind, for if the blind are to be teachers of the blind the prospective teachers must receive an education of such breadth as will lift them out of the narrow groove in which the blind are apt to move. It is the chief printing and publishing agency of books for the blind, both in braille and Moon's types. Books are a boon to the sighted; they are a positive necessity to the blind, for through them alone can they enter into the chief avenues of thought and inspiration, which are the treasures of our civilization. The books are sold on such terms that there is a heavy annual loss, which has to be made up by benefactions to the extent of £7,000 per annum. The works printed include all manner of educational and scientific works, and those necessary for university students, of which there are not a few. There is also a large output of music sheets in braille.

The Institute issues no less than ten newspapers and periodicals. It has a massage school from which 152 students have qualified, a special library for these students of 493 volumes in charge of a blind medical man, and through the after-care department it assists its workers to obtain suitable posts. It has a staff of thirty-nine home teachers for the blind whose work is chiefly the teaching of those recently blinded. In addition to all this it maintains four guest houses, homes, or hostels for the blind. That is no small record for a voluntary institution. And those who have had experience of the manner in which this Institute takes up the case of a blind person referred to it for help in training or in obtaining suitable work can testify to the alertness of its officers and to the lack of red tape which marks their procedure.

On the testimony of the report of this voluntary institution we think that the Labour party is wrong in belittling voluntary effort, and that the Advisory Committee is right in recommending the Ministry of Health to use such voluntary effort in preference to municipal machinery.

[2] *The Blind Persons Act, 1920.* Published by the National Joint Council of the Trades Union Congress and of the Labour party, Eccleston Square, London. (Undated.) 3d.

[3] *The Annual Report of the National Institute for the Blind.* 1921–22 Great Portland Street, London, W.1.

England and Wales.

CARDIFF OUT-PATIENT CLINIC IN PSYCHIATRY.

IN his last annual report on the work of the City of Cardiff Mental Hospital* the medical superintendent, Dr. Edwin Goodall, makes interesting reference to the out-patient clinic in psychiatry, which was started by him in May, 1920, with the joint approval of his committee and the authorities of the King Edward VII Hospital, Cardiff. This clinic is held every Tuesday afternoon in the out-patient department of the general hospital. Its purpose is to give advice and treatment (*a*) in early and recent cases of the psychoses and psychoneuroses; and (*b*) to patients who have been under treatment in the Mental Hospital, both during their period of discharge on probation, and subsequently if they feel in need. Dr. Goodall states very cogently his reasons for securing that the psychiatric clinic should be part of the out-patient department of the general hospital, and not merely an out-patient department of the mental hospital. He regards the setting up of this clinic as a step of the first importance in the treatment of mental and allied disorders, and two years' experience strengthens him in his insistence on the urgent need for an indoor psychiatric clinic to work in conjunction with it. The out-patient department, he declares, will not be fully successful until suitable indoor accommodation is available. Meanwhile, in co-operation with the medical staff of the King Edward VII Hospital, certain cases of a suitable kind have been received into that institution under the physicians, thereby securing for the patients that investigation from the standpoint of general medicine which is what they need. Dr. Goodall acknowledges his gratitude to the physicians for letting him collaborate with them in this matter. To illustrate the kind of cases dealt with at the clinic he classifies the first hundred patients into groups, and from this he infers that "in Cardiff medical ideals in regard to the treatment of early mental and allied disorders have been attained as nearly as they can be, failing the indoor clinic in psychiatry, which is bound to come sooner or later."

MANCHESTER ROYAL INFIRMARY.

A bazaar is to be held on the first three days of November for the purpose of raising the first £10,000 of a £100,000 fund which is required to build a new nurses' home for the Manchester Royal Infirmary. The great expansion of the work of the Infirmary since the new buildings were opened some thirteen years ago has made a new nurses' home necessary. When the new Infirmary was built accommodation was provided for 189 nurses, but with the increased staff many nurses have now to be lodged outside, an arrangement which has obvious inconveniences. Nurses on night duty have now a 73-hour week and on day duty a 63-hour week. It is agreed that these hours of duty are much too long, and the Board of Management is anxious to reduce them. A uniform week of 56 hours for both day and night duty is aimed at, but for this reduction at least 65 more nurses are required. It is to accommodate those 65 nurses and to bring under one roof the other nurses who are at present compelled to live outside the Infirmary that the new home must be built. Gifts of money and goods for the bazaar may be sent to Miss M. E. Sparshott, matron, Royal Infirmary, Manchester.

Scotland.

PROFESSORIAL APPOINTMENTS FOR GLASGOW GRADUATES.

As we briefly announced last week, Dr. G. Haswell Wilson has been appointed professor of pathology in the University of Birmingham in succession to Professor J. Shaw Dunn, who has been elected to the corresponding post in the University of Manchester. Both Dr. Wilson and Professor Shaw Dunn are graduates of the University of Glasgow, the former having graduated M.B., Ch.B. (with commendation) in 1906, and the latter M.B., Ch.B. (honours) in 1905 and M.D. (honours) in 1912. Dr. Wilson, after holding a Carnegie Research Scholarship and Fellowship, was appointed assistant to the professor of pathology and assistant pathologist to the Western Infirmary, Glasgow, in 1911, and three years later became lecturer on pathological histology in the University; in 1918 he was appointed lecturer in bacteriology, and in the following year pathologist to the Royal Hospital for Sick Children.

*City of Cardiff Mental Hospital. Fourteenth Annual Report, for the year 1921. Cardiff: S. Glossop and Sons, Ltd.

MEDICAL LUNCH CLUB, GLASGOW.

This club resumed its activity for the season on September 7th, when Dr. John Henderson presided over a good attendance of members. After lunch various items of business were discussed. The place, day, and hour of meeting were adhered to as formerly, being considered most suitable, and it was decided to resume the weekly meetings for the season on October 5th, when office-bearers would be appointed for the year. The report of last year's working was favourably received, and it was unanimously agreed that the club fulfilled a useful function amongst the profession in Glasgow, but that its usefulness could be much greater were its membership increased. To this end it was emphasized that, although the club was instituted under the auspices of the Glasgow Eastern Branch of the British Medical Association, its membership was open to all practitioners in Glasgow and neighbourhood.

ANDERSON COLLEGE OF MEDICINE.

At the last quarterly meeting of the governors of the Anderson College of Medicine, Glasgow, it was announced that Professor J. Arthur Thomson of Aberdeen would give the introductory address at the opening of the winter session. The resignations were received with great regret of Dr. John Macintyre from the lectureship on diseases of the throat and nose and of Dr. W. D. Macfarlane from the professorship of midwifery and gynaecology. Dr. Macintyre has held his appointment for thirty-one years, and is also Dean of the Medical Faculty of the college; Dr. Macfarlane has been professor of midwifery for the past eleven years. The report on the work of the summer session showed that the number of students attending was 357.

India.

WOMEN'S MEDICAL SERVICE.

THE annual report* for 1921 of the National Association for Supplying Medical Aid by Women in India shows that the work of the Association and its affiliated institutions is continuing to make excellent progress. On January 1st, 1921, there were thirty-three medical officers on the cadre of the Women's Medical Service for India. It is stated that the work done in most of the hospitals under the control of the Service has been excellent, and in nearly all of them the numbers treated have increased. The financial position is difficult on the whole; but in some cases improvement has taken place owing to the increased popularity of the hospital leading to a larger number of subscriptions and the realization of larger sums from hospital stoppages. According to an appendix in the present report there are now no fewer than 135 women's hospitals in India, large and small (including mission hospitals), staffed entirely by women. The Lady Hardinge Medical College continues to prosper, and there are eighty-five students in residence. The course of study at the College lasts for seven years—two in science and five in medicine; as the College was opened less than six years ago no medical graduates have yet passed out, but in May, 1923, nine students will appear at Lahore for a final M.B., B.S. examination, and thereafter the College should turn out annually an increasing number of highly qualified medical women. The ordinary income of the Countess of Dufferin's Fund, upon which the provision and training of medical women and the upkeep of women's hospitals in India largely depend, amounted to Rs. 47,177, and the ordinary expenditure of the council of the Fund during the year was Rs. 36,124. A subsidy of Rs. 4,24,455 was received from the Government of India to meet the cost of the Medical Women's Service for India. The year closed with a balance in hand of Rs. 2,65,748. The Countess of Reading, who has taken a great interest in the organization of the medical relief of women since her arrival in India, has issued a public appeal for a "Women of India Fund," which it is hoped will remain permanently open and will be used from time to time to assist departments most needing help.

*Annual Report of the National Association for Supplying Medical Aid by Women in India for the Year 1921. Calcutta: Superintendent Government Printing, India. 1922. 1 rupee 8 annas.

In the first instance it will be used to complete the buildings of the Lady Hardinge Hospital, Delhi, and then to open a women's hospital in Simla; later it is hoped to further the organization of an Indian nurses' association.

NEW MEDICAL COLLEGES FOR BENGAL.

Sir Surendra Nath Banerjee, Minister of Public Health, presided at Calcutta over the inaugural meeting of the National Medical College and King's Hospital, a private medical institution founded in Calcutta, which will be affiliated to the State medical faculty. The Minister said that there was a paucity of qualified medical practitioners in India, and the Provincial Government would rejoice if more medical schools were established. Two more medical schools were, he said, in fact likely to be started shortly—one in connexion with the Sambunath Pandit Hospital, and the other at Howrah. The Burdwan Schools were already started, and others were in course of preparation at Mymensingh, Chittagong, and Berhampore.

CONVICTION UNDER BOMBAY MEDICAL ACT.

At Bombay, in June last, a man named J. F. C. Wood was charged, under the Bombay Medical Act, with assuming certain medical degrees to which he was not entitled. A full report appears in the *Pioneer Mail* for July 7th, 1922. The accused applied to the registrar of the Bombay Medical Council for permission to register as a medical practitioner; the reply to an inquiry addressed to the General Medical Council was unfavourable. The accused stated that his diplomas were deposited with his mother before leaving on field service for Mesopotamia, and he had since lost trace of his mother's whereabouts. He did not know why his name did not appear on the *Register*. He undertook not to practise medicine or surgery until he had satisfied the Bombay Medical Council. The magistrate found the accused guilty, and fined him 201 rupees.

PRESENTATION TO DR. N. H. CHOKSY.

Dr. N. H. Choksy, late of the Bombay municipal health department, was recently presented with an address in a silver casket by the Bombay Medical Union and other medical friends. The address referred to Dr. Choksy's eminent public services, extending over thirty-four years, and especially to his devotion to duty during many serious epidemics. Dr. Choksy has also been honoured by the King by being made a Companion of the Order of the Indian Empire.

Correspondence.

BONE GRAFTING IN TUBERCULOUS SPINAL CARIES.

SIR,—I would not like that through Mr. Roth's letter (August 12th, p. 284) on the subject of bone grafting in spinal caries a misunderstanding should arise concerning my methods for the reduction of deformity.

We do not try to obtain the straightening of the deformity caused by the cicatrized vertebral bodies, but we reach its apparent reduction by its soft and progressive driving back by means of compensatory lordoses above and below the formerly diseased region. What still subsists of the deformity is concealed by the muscles which are remarkably developed by heliotherapy. Because these compensatory lordoses are necessary it is very much more easy to get a reduction of deformity in the dorsal region than in the cervical and lower lumbar regions. This explains why I could once write to Mr. Roth:

"The gibbosity, when situated in the dorsal and also dorso-lumbar region, has, as a rule, been corrected, and always given us the best results."

With regard to the question of immobilization, it is our practice to keep the patient strapped down flat upon his back during the active stages of the disease, and not to allow the change to the ventral position (which is so potent in the correction of deformity) until clinical and radiographic examination show the disease to have entered on a quiescent stage.

In his statement, that relapse is less common after operative than after conservative measures, I think Sir Henry Gray must have the plaster jacket in mind, more than other methods of conservative surgery. The muscles, whose function it is to support the spinal column in an extended position, are so atrophic after a long course of plaster-jacket treatment that far too much weight is thrown on the anterior part of the vertebral bodies, with the result that the disease is likely to be reawakened. The splendid "muscular corset" developed by patients treated by heliotherapy makes them often look like athletes, achieves quite as satisfactory a result as an Albee graft, and does so in what is, to my mind, a much more natural way.

My own experience is that treatment directed towards the rehabilitation of the general health is a much more effective way of guarding against relapse than any form of local treatment. I am becoming more and more convinced that tuberculosis is to be looked on merely as a local manifestation of a general disease, and it would really be a pity if by Albee's operation this fact were to become forgotten.—I am, etc.,

Leysin, Sept. 16th. A. ROLLIER.

OPHTHALMIC EXAMINATIONS IN GENERAL MEDICINE.

SIR,—Dr. Hawthorne's paper in the JOURNAL of September 16th (p. 495) on "The significance of retinal haemorrhages" calls attention to the necessity and usefulness of ophthalmic examination in the practice of medicine, and yet, sad to say, how few men use the ophthalmoscope in their daily practice.

With the electric ophthalmoscope there is little difficulty in quickly obtaining the required manipulation of the instrument. It is one of the drawbacks of the extreme prevalence of specialties in every branch of our profession that many men are gradually but surely giving up the use of special modes of examinations, which are not difficult to learn, and are allowing them to be placed in the hands of a few special men. It is well known that a large number of so-called eye cases occurring in practice are primarily medical cases, and really should be diagnosed and treated by physicians.—I am, etc.,

Folkestone, Sept. 18th. W. J. TYSON, M.D., F.R.C.P.

AN UNSUSPECTED PREGNANCY.

SIR,—After reading Dr. Fletcher's communication on unsuspected pregnancy in the JOURNAL of September 16th (p. 516), and in view of its medico-legal significance, I send you the following record of an experience I had in a similar case.

Early one morning a few years ago I was called to a lady visitor who had been taken ill suddenly at an hotel. I found she had just been delivered of a full-time healthy child, no one else being present in the room, and no one knowing she was in labour. The baby was born into the *pot de chambre* and fortunately survived the ordeal. The umbilical cord had been torn across, no ligature had been applied, and there had been no unusual amount of haemorrhage, either maternal or umbilical. I expressed the placenta, gave the usual attendance, and the subsequent history was uneventful. She was a married woman and this was her first pregnancy. She had no idea that she was pregnant, and said that her menses had been perfectly regular, the last occasion being one month previous to her confinement. Her mother, with whom she had lived several months during her pregnancy, corroborated this statement. She was employed by a firm of wholesale costume manufacturers as a mannequin, and the afternoon before this event took place had been displaying evening dresses and costumes on her figure with their representative. This man, who was married and the father of a family, had detected nothing unusual about his assistant. In the early part of the night she had complained to him of abdominal pains, and he had given her some whisky. He was very much surprised to hear next morning what had happened. A few weeks later the husband wrote to me and I furnished him with a full report of the case. Since then I have heard nothing more of the patient.—I am, etc.,

Manchester, Sept. 17th. ALFRED WILLIAMS, M.D.

PSYCHO-ANALYSIS.

SIR,—We are fortunate with men like Dr. McBride having leisure and ability to draw our attention to the antitheses of writers on dreams and other nervous phenomena, and probably his modesty makes him apply the word "desultory" to his study of such subjects.

Many years ago, when making extracts from Continental writers on dreams and other nervous states, one of my assistants suggested that some of the patients seemed acquainted with "leg-pulling," and during and since the war patients have been known to elaborate hypothetical dreams

in anticipation of an impending interview with psycho-analysts. There seems no reason why the old soldier should not be played on psychic as well as other ailments.

In your article on shell shock at page 392 of the JOURNAL you quote an eminent authority as stating: "The war created nothing in the way of psychoses." During the war, however, many doctors joined the forces, and were brought up against soldiers with nervous troubles, and having had no special training or experience in such conditions deemed what they observed as new, not only to themselves but to others.

Dr. Adamson in his letter (p. 402) defines the chief duty of a psycho-analyst, and it seems dangerously near to using leading questions, which often enables one to obtain the replies wished for. Psycho-analysis resembles in no small degree the detailed and painstaking history of any given case, and we would be equally justified in using such terms as cardio-analysis or pelvic analysis, according to the position of the symptoms or ailment.

In the *Journal of Mental Science* for July there are two such cases well reported, and Dr. Good is worthy of all praise in restoring two cases of supposed neurasthenia to their proper place of traumatic nervous diseases, but psycho-analysis does not seem the prime factor in the diagnosis.

The words "conscious" and "unconscious" have supplied food for metaphysical discussion for centuries; hence the variety of terms concerning them. The conscious may be readily recognized, but not so the unconscious. A muscle not active is said to be at rest and ready to act again if required; it is not said to be palsied. So should we hesitate to apply "unconscious" to any part of the brain for the moment inactive. Rather should we say it was at rest, and in fact use the word "unconscious" as seldom as possible, preferring to qualify the word "conscious."

Sir W. Hamilton, following Horace after a lapse of nearly two thousand years, revived two words easily understood, in common use in other sciences, and applied them to conscious states—namely, "latent" and "potential"—the former meaning a conscious which was and may be again, the latter an actual or potential state and which now is.

The greater part of our knowledge lies in the domain of latent consciousness, ready for use when required.

May I remind Dr. Ladell that at Edinburgh University during the summer sessions over fifty years ago a very complete course of lectures on medical psychology was delivered, combined with clinical instruction twice a week at Morningside Asylum?—I am, etc.,

Harrogate, Sept. 5th. T. JOHNSTONE, M.D.

STERILIZATION OF MENTAL DEFECTIVES.

SIR,—It is impossible to answer Surgeon Commander Bastian (September 9th, p. 490) fully in a letter. He raises issues on which hang questions not only of science, but of practical policy, many of them connected with mind, of greater importance than even the prevention of idiocy.

What is the nature of man? What in him is innate, what acquired, and what inherited? What can be effected by mere training, and what only by selective breeding? What lines should training, and, if absolutely necessary, selective breeding, follow? All these problems, linked with every detail of human life, are discussed on platforms and in pulpits and print every day, but with futility; for, since crucial tests are rarely applied, and never frankly accepted, there is no agreement as to basic principles. It is about these basic principles that Surgeon Commander Bastian inquires. I am very sure that doctors are the only considerable body of men who are fitted by knowledge and training to apply the right tests and trace the inevitable consequences, and equally sure that before long they will do so; but hitherto, though eager as individuals they have as a body fought shy of problems that seem remote and complex. Actually the necessary facts are in the hands of all doctors, and for people who think in terms not of mere words, but of reality, the problems themselves are simple. In what follows I shall give the appearance of controversy, for I deal with debated matters and must indict a whole "science." But of controversy, based on preconceptions and mere words, we have had enough outside the ranks of medicine. A little cool discussion, founded by doctors on verifiable evidence, conducted in precise language and with an open-minded readiness to accept crucial tests, should soon put a new aspect on affairs. May I, therefore, beg each reader to judge from facts within his own knowledge?

As stated in my letter (August 26th, p. 401), the individual springs from a germ cell in which are none of the features (characters) that he develops subsequently, but only predispositions to develop them in response to fitting nurture. It follows that he inherits only predispositions, and that every character he develops is a product of nature *and* nurture. Because men and trees have different natures they require different nurtures and develop differently. Speaking generally, the individual develops characters only when they are needed. Some characters (for example, head and heart) are always needed, and therefore Nature has arranged that the necessary nurture shall always be experienced. Other characters (for example, scars which repair injury and blacksmith's muscles which follow heavy labour) are only exceptionally needed, but, provided the individual's nature permits, they arise just as surely as the head and heart when the proper nurture is experienced.

We know that the differences between two separate individuals are natural *or* nurtural. Thus a man may be darker than his parent by nature or through sunburn. Here the thinking is clear and the language precise. Technically, natural (innate, germinal) differences are termed "variations," while nurtural (acquired, somatic) differences are called "modifications." We know what we mean when we say that variations are inheritable—that is, that differences in predispositions tend to be transmitted to offspring, so that given similar nurture they develop similar differences. But can any man explain precisely what he means when he says that modifications are (or are not) inheritable? If he tries he will find that he is playing with words, and confusing inheritance with reproduction, or even with non-inheritance. But in this connexion modifications belong to the same category as characters about which Surgeon Commander Bastian inquires.

First, let us note that variations and modifications are not characters, though they are revealed in characters. We can always contemplate a character in a single individual, but we cannot perceive a variation or a modification unless we compare separate individuals. Thus, if a normal man's son has a sixth digit, then that digit is a character which indicates that the son has varied from his parent. If the grandson reproduces the digit it remains a character, but no longer indicates a variation from the parent. Clearly, then, variations and modifications are not characters, but relations of difference between individuals—parent and child, grandparent and grandchild, negro and white, and so on. Nevertheless they are constantly confused with characters, and just here has been the starting point of an enormous amount of loose thinking and writing.

As we see, differences between individuals (variations and modifications) are innate *or* acquired, natural *or* nurtural, germinal *or* somatic in origin. But in what sense is any character more innate *or* acquired than any other?

If we compare two men we can say with clear meaning and in precise language that they differ innately as regards heads, and by acquirement as regards scars. But if we compare a man's characters and say, for instance, that the head is innate and the scar acquired, what in the world *can* we mean? Head and scar are both products of ancient evolution, both depend on germinal predispositions and fitting nurture (and on nothing more and nothing less), and both are situated in the soma.

Obviously, therefore, characters, unlike differences between individuals, are both natural *and* nurtural, innate *and* acquired, germinal *and* somatic. I hope I have managed to make myself clear, for here—in the fact that differences between individuals are innate *or* acquired, whereas the characters in which those differences occur are themselves innate *and* acquired—we have, I think, the key to the whole problem. Missing the key, we have before us nothing but a continuance of that immense mass of loose thinking and unending controversy which has disgraced this subject for more than a century; holding it, the door opens and the road before us is plain. Missing it, we shall deal only with words; holding it, we shall be in contact with the realities of nature. There are sure to be readers who think I am exaggerating. Well, let them try to conceive of a character as innate *or* acquired.

Contemplate the consequences of loose language and thought.

Consider such a sentence as the following, the like of which may be found in almost every page of biological literature. "John's head is innate, but his scar is acquired, and therefore his child inherits the former, but not the latter." In the case of the head, since only predispositions are transmitted, we can mean only that the child, inheriting John's predisposition, reproduces, in response to similar nurture, a similar character. The child is, then, like his parent both by nature and nurture. If we give our words the same meanings, we should say that a child inherits a scar when he reproduces it in the same way as the parent produced it. Again, he is like the parent both by nature and by nurture. But biologists, who are nearly all zoologists and botanists, would not regard this as inheritance. They would regard the scar as inherited only if the child reproduced it in a way in which the parent did not, and could not, have produced it.

He would then, notwithstanding a superficial resemblance, be profoundly unlike the parent both by nature and by nurture. But unlikeness is not inheritance. It is variation—that is, non-inheritance. So that here, in a single sentence, "innate" and "acquired" are used to indicate distinctions where there are no differences, and "inherit" is given two directly contrary meanings. Is not this a mere playing with words? Conceive the confusion of thought and language! As Francis Bacon said: "Men believe that their reason rules over words, but it is also the case that words react, and in their turn use their influence on the intellect." Here the transference of three words from differences between individuals to the characters in which the differences are revealed has resulted in a century of stasis in what should be the queen of sciences. Not even the old schoolmen produced anything so merely verbal.

Characters result from the action of nurture on predisposition. Nature has evolved these actions and reactions to fit species to their environments, and therefore normal characters, normally developed (for example, a scar when it repairs injury), are always useful. For millions of years living beings develop characters normally, but at long last a biologist observes a character which he calls "acquired," and wonders whether it is "inheritable." Thereafter he, his fellows, and their successors debate the matter for a century. Such is the power of words. What they mean, if they mean anything, is that when the "acquired" character is observed the whole scheme of nature tends, astoundingly, to be upset, and that this useful feature tends henceforward to appear a useless thing in response to a new form of nurture. Of what use, for example, would scars be to the unwounded descendants of a wounded man, or big muscles and horny hands to the sedentary descendants of a blacksmith?

Which are the characters which biologists distinguish as innate, and which those they call acquired? Such is the power of tradition—that is, words—that they have followed without question the man in the street, who, in thoughtlessness, has always called everything which develops in response to glaringly obvious nurture "acquired," and everything else "natural." The distinction is good enough for his purposes, but it is not for science. Thus, though human muscles develop from birth forwards solely in response to use, yet only exceptional muscular developments such as the blacksmith's are described as acquired by biologists.

It is sometimes maintained that "innate" and "acquired" are technical terms; but, as may be seen plainly in literature, biologists have genuinely supposed that some characters are products of nature without nurture, and others of nurture without nature. Hence their terms "germinal" and "somatic." The matter has been discussed at length (*Nature*, November, 1920; May, 1922), and, though many biologists declare that they know exactly what their terms mean, all attempts to explain or define have failed. Some have said that "innate" implies normal and "acquired" exceptional. But why not use precise language? Besides, many exceptional characters (for example, birthmarks) are regarded as innate, and many normal traits (for example, knowledge of the English language in England) are considered acquired. Others, again, say that an acquired character is one which develops in response to the nurture of use, and that all others are innate. But many characters (for example, scars) which are termed "acquired" do not develop in response to use, and most characters which do so develop (for example, ordinary muscles) are termed "innate."

With the conspicuous exception of Darwin, who, in all that remains valid of his work, reasoned from the basis that *variations* are innate and transmissible, most biologists—for instance, Lamarck and Weismann—have founded their speculations on the idea that characters are innate *or* acquired, transmissible *or* non-transmissible. This is the basis of modern biology. Taking that much for granted, and assuming also that nature and nurture are warring forces, they have tried to ascertain, for example, what is innate and what acquired in the individual, and whether nature or nurture is the stronger—which is like trying to discover whether the engine or the steam is the more potent in moving the train. The significant thing in all this for medical men is that our own science, physiology, is in direct opposition. Physiologists assume that nature and nurture are collaborating forces; suppose, therefore, that all characters are equally innate, acquired, and transmissible; and, taking predisposition for granted in every case, seek merely to ascertain what nurtures cause what characters to develop. We know clearly what physiologists mean; but can any biologist explain in precise terms what *he* means? Physiologists have a large body of interpretation, the truth of which is universally admitted, but there is hardly an item on which biologists are agreed. Physiologists proceed on the assumption that normal characters have, or had, functions, and already in the case of man, the best known living being, have ascertained the utility of almost every feature; but biologists are still disputing as to whether living beings are adaptional forms. In brief, physiologists have followed Bacon's advice and founded their science on reality, whereas biologists, like the schoolmen whom Bacon is supposed to have destroyed, have based their disputations on misused words. Hence the unending controversies.

The amusing thing is that biologists have always assumed an air of patronage towards medical men, who are supposed to be too ignorant or untrained to grasp the subtleties and complexities of heredity. Even decisive medical facts have been consistently ignored. I suppose some doctors have been hypnotized; but it is all crazily absurd. There is not a big problem about which biologists have disputed which could not be settled immediately if undisputed medical evidence were used crucially and with ordinary common sense. The simple physiological truth, "Variations are the sole cause of non-inheritance; apart from variations, like begets like when parent and offspring develop under like conditions of nurture," covers almost the whole field. There remains nothing besides but the causation of "spontaneous" variations and the function of sex (with which is bound up the problem of alternate inheritance and reproduction). Both these problems are physiological. Of course, however, when the basic truths are established, there remains an enormous field for application—as, for instance, in the prevention of idiocy and the training of normal children.

I venture now to raise a question which seems to me important. Medical science has grown so enormously that we are all ignorant of much which we should know. Even six years of strenuous labour leave the student inadequately trained. Knowledge is worthless unless it be useful practically or intellectually. Is it right to compel learners to spend valuable time over the traditional zoological and botanical studies? The information acquired is of no practical utility to the physician or surgeon, and is, as a rule, forgotten as soon as the prescribed examinations are passed. For the same reason it is useless intellectually. Moreover, consider the dismal mess that lifelong students of natural history have made of their own thinking. Is it not high time that medicine cut her leading-strings and established her own biology and study of heredity on what has never yet been done—a physiological basis?—I am, etc.,

Southsea, Sept. 17th. G. ARCHDALL REID.

Obituary.

JAMES DONELAN, M.B., M.CH.(R.U.I.),

Surgeon, Throat and Nose Department, Italian Hospital, London.

MR. JAMES DONELAN, well known among London laryngologists, died on August 25th at the age of 65. He received his medical education at Trinity College, Dublin, and the École de Médecine, Paris, and graduated M.B. and M.Ch. (with honours) at the Royal University of Ireland in 1886. After holding several resident appointments in Dublin he became a clinical assistant at the Throat Hospital, Golden Square, London, where he was associated with Sir Morell Mackenzie. He acted as private assistant to Mackenzie for nearly five years, and helped him with the (unpublished) revised edition of his work on diseases of the nose and throat; he was in charge of Mackenzie's practice while the latter was in Germany in attendance on the Emperor Frederick. Mr. Donelan was appointed surgeon to the throat and nose department of the Italian Hospital, Queen Square, in 1895, and held that appointment until his death. He was made a Chevalier of the Crown of Italy in 1909, and promoted Officer in 1918. During the war he was responsible for the organization of the "short service" system by which over 300 British and colonial surgeons gave voluntary service to the French wounded from 1914 to 1916, and he acted as surgeon in charge of the Ambulance Hospital, Crépy-en-Valois, during the first battle of the Aisne. He had been honorary secretary and a member of the council of the Laryngological Society of London, and in 1918–19 he made a most popular president of the Section of Laryngology of the Royal Society of Medicine, of which he was a Fellow; his presidential address on "Morell Mackenzie, the father of British laryngology," was published in the *Journal of Laryngology and Otology* in June, 1919.

James Donelan will perhaps chiefly be remembered as a genial link between the early days of laryngology in England and its status as a surgical specialty to-day. His private charities were many, and the poor—notably those of his own church—were always a particular care to him. In his younger days he had been an oarsman of some note, having won several cups, and latterly he was a great lover of music, books, old silver, and furniture. His death may have well been hastened by his strenuous work in Paris during the

recent International Congress of Oto-Laryngology; he was a member of the committee of organization, and spoke each day in English, French, and Italian, interpreting the speeches of other members of the Congress. He is survived by his widow and daughter, and a son who qualified lately as a medical man from St. Bartholomew's Hospital.

THE death took place, on September 4th, of Dr. JOSEPH CARROLL of Whelley, Wigan, in his 63rd year. He was educated at Glasgow University and Anderson College, and graduated M.B., C.M.Glasg. in 1882; he took the D.P.H. at Cambridge in 1891. He was for a time lecturer in hygiene and public health at Anderson College, and later went into practice at Ilkeston, Derbyshire, where he held the appointments of surgeon to the Ilkeston Cottage Hospital and medical officer of health. During the war he held a commission as Captain in the R.A.M.C.(T.), and served with 2/3 Welsh Field Ambulance in various theatres of operation. He was medical officer for the Wigan Union, and held the post of medical officer for the Wigan district under the Ministry of Pensions.

The Services.

DEATHS IN THE SERVICES.

Lieut.-Colonel Walter Croker Thomas Poole, R.A.M.C.(ret.), died at Caxton, Cambridge, on September 9th, after a long illness, aged 69. He was born on November 12th, 1853, and was educated at Trinity College, Dublin, where he graduated as A.B. and M.B. in 1878, also taking the L.R.C.S.I. in the same year, and subsequently the F.R.C.S.I. in 1890. Entering the army as surgeon on February 5th, 1881, he became lieutenant-colonel after twenty years' service, and retired on February 14th, 1903. He served in the South African war in 1900-02, and took part in the relief of Ladysmith, including the actions at Spion Kop, Vaal Krantz, and Pieter's Hill, and the operations in the Tugela Heights; in the operations in the Transvaal from March to June, 1900, including the action at Laing's Nek; and in the Transvaal from November, 1900, to May, 1902; receiving the Queen's medal with five clasps, and the King's medal with two clasps.

Medical News.

THE winter session 1922-23 at Charing Cross Hospital Medical School will be opened by the annual prize distribution, which will take place in the Out-patients' Hall of the hospital on Tuesday, October 3rd, at 3.30 p.m. Viscount Burnham will distribute the prizes. The annual dinner of past and present students will be held at the Imperial Restaurant (Oddenino's), Regent Street (entrance in Glasshouse Street), on the evening of the same day, at 7 for 7.30 p.m., with Lord Burnham in the chair. Tickets, 12s. 6d. each, can be obtained from the honorary secretary to the dinner, Mr. Frank Noakes, Charing Cross Hospital, London, W.C.2.

AN autumn special course, arranged by the North-East London Post-graduate College, will be held from October 16th to October 28th inclusive, at the Prince of Wales's General Hospital, Tottenham, N.15. As on former occasions it will include, in the mornings from 10.30 a.m. to 12.45 p.m., practical demonstrations of clinical methods applicable in medical practice, the exhibition of illustrative cases, etc., and in the afternoons, from 2 to 5.30 p.m., demonstrations of groups of selected cases, cliniques in the various general and special departments of the hospital, and clinical lectures. On Saturdays demonstrations will be given in adjacent special hospitals. Luncheon will be obtainable in the neighbourhood of the hospital, and tea will be provided each afternoon. A syllabus of the course with any further information desired may be obtained from the Dean.

THE League of Nations Committee for the study of international questions concerning intellectual co-operation held a session at Geneva last month under the chairmanship of Professor Henri Bergson. It was decided that arrangements should be made to hold an international congress of the universities of all countries. The subcommittee charged with the arrangement of this congress was instructed to prepare a report on the following topics: The exchange of professors and of students; the equivalent values of university courses and degrees; the institution of international scholarships, of international vacation courses, and of a central office for information on university matters.

IT is announced that Dr. Wilbur C. Smith will combine the appointments of "athletic director" and professor of anatomy at Tulane University, U.S.A.

FRIDAY, October 6th, has been set apart for an organized effort in London under the patronage of the Prince of Wales, on behalf of the Joint Council of the Order of St. John and the British Red Cross Society and the Combined Hospitals of London.

THE annual general meeting of the Medical Sickness Annuity and Life Assurance Society will be held at the offices of the society, 300, High Holborn, W.C., on Monday, October 2nd, at 4 p.m.

THE winter session of the Harveian Society will open with a clinical meeting, to be held at Paddington Green Children's Hospital, on Thursday, October 5th, at 4.30 p.m., when many interesting cases will be shown.

AT the opening of the new session at the Westminster Hospital School of Medicine on Monday, October 2nd, at 3 p.m., Mr. G. T. Mullally, assistant surgeon to the hospital, will give the introductory address, "The art of medicine."

MEDICAL practitioners are sometimes asked where instruction in infant care may be obtained by lay workers. Elementary courses in this subject are given at Carnegie House, 117, Piccadilly, W.1, under the auspices of the National Association for the Prevention of Infant Mortality and for the Welfare of Infancy, and the National Society of Day Nurseries. The next courses of lectures for crèche nurses and probationers, on the one hand, and for infant welfare workers, teachers, mothers, etc., on the other, will begin early in October. Applications should be addressed to the Honorary Secretary, Miss Halford, at the above address.

THE University of London Press announces for early publication a study of the human mind, from the metaphysical and neurological aspects, entitled *Elements in Thought and Emotion*, by Mr. George G. Campion, who has had assistance from Mr. Santayana and Professor G. Elliot Smith.

A COURSE of twelve lectures on the management and feeding of infants and young children will be given to qualified practitioners by Dr. Eric Pritchard, at the St. Marylebone General Dispensary, on Thursdays and Mondays from October 5th to November 13th, at 6 p.m. Arrangements have been made for those taking part in the course to attend the infant consultations at the Infants' Hospital, Westminster, and to visit the Nursery Training School at Golders Green. The fee is two guineas; information and tickets may be obtained from the Secretary, 77, Welbeck Street, W.1.

THE Rhode Motor Company of Tyseley, Birmingham, is advertising a new Rhode "all weather" coupé at £325. The chassis is the standard 9.5-h.p., with the Rhode four-cylinder water-cooled overhead valve engine.

DR. JOKICHI TAKAMINE, well known for his work on diastatic ferments and the active principles of the suprarenal glands, died recently in New York; he was born in Tokyo in 1854.

THE medical officer of health of Toronto recently stated in a health bulletin that there were more deaths in Toronto in 1921 from venereal diseases than from either cancer or tuberculosis. There are six venereal disease clinics in Toronto, and during 1921 33,322 cases were given treatment.

THE Mexican Medical Association recently celebrated the third anniversary of its foundation, when, in addition to other celebrations, a speech was delivered by Dr. Brieso Vasconcelos, editor of the *Gaceta Médica de México*.

A MEMORIAL to Dr. A. Charpy, professor of anatomy in the University of Toulouse, has been erected by the Faculty of Medicine of the University.

ACCORDING to a recent census there are at present 22,990 medical practitioners in France, of whom 5,415 are in Paris and 17,575 in the departments and colonies. There are thus four times as many doctors in proportion to the population in Paris as in the departments.

DEATHS from acute alcoholism in New York have increased this year 27 per cent. over last year and 89 per cent. over 1920, according to the records of Dr. Charles Norris, chief medical examiner. These figures include only those persons who died without medical attention, and Dr. Norris considers that many others attended by private medical practitioners have died from the same cause.

WE have received a copy of a pamphlet, *Torquay Marine Spa*, issued mainly to set forth the facilities for treatment provided by the Corporation Medical, Electrical, and Turkish Baths, which were reconstructed in 1914, and have been kept up to date. A great variety of baths can be obtained, and with regard to the selection of those suitable to any particular case, medical men practising in or near Torquay are prepared to advise. The pamphlet also contains a general account of Torquay and its climate. Copies can, we understand, be obtained from the General Manager of the Baths.

THE death is reported of Dr. J. K. A. Wertheim Salomonson, professor of neurology and radiology at the University of Amsterdam, on September 16th, at the age of 58.

THE first woman medical student in Turkey has recently been registered at the Constantinople faculty of medicine.

THE available life tables in the United States for the year 1920 show that there has been an increase of 2.75 years in the life span in the last twenty years (1901 to 1920). The expectation of life at birth in the United States is said now to be 54.3 years, while in 1910 it was 51.5, and in 1901 49.2. In the last two decades there has been added five years to the expectation of life, and the span of life has been lengthened by a fifth in one generation.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2630, Gerrard.

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

SCHLATTER'S DISEASE.

"W. G." writes: I have under my care what I believe to be a case of Schlatter's disease—epiphysitis of the knee-joint. I have tried to find references to its pathology, etc., but so far without result. Can you give me any assistance?

*** "Schlatter's disease" is the name given to avulsion of the tubercle of the tibia. The following references will be found to supply all the most recent information on the subject: *Beitr. z. klin. Chir.*, 1920, cxx, p. 319 (this is the best and gives fullest bibliography); *J. Orth. Surgery*, 1921, iii, p. 550; *Norsk Mag. for Laegevidenskaben*, 1921, xxxii, p. 320; *Chirurg. degli Organi di Movim.*, 1921, v, p. 353; *Annal. Surg.*, 1921, lxxiii, p. 77; *Lancet*, 1921, i, p. 482.

MCINTYRE'S, BUSK'S, AND WINCHESTER'S SPLINTS.

"IGNOTUS" would like to know if some correspondent of the JOURNAL could kindly inform him where any published reports of the splints devised by Professor Busk and Mr. Winchester can be found. They were mostly modifications of McIntyre's leg-splint and Desault's and Liston's long splint. The works of McIntyre and Desault are to be found in medical libraries in London, but Busk when he practised surgery wrote very little, though after taking up anthropology he wrote much that is of permanent scientific value. Mr. G. W. H. B. Winchester died in 1901, leaving no well-known writings.

ASTHMA.

DR. THOMAS MARTIN (Peebles) writes: I have a patient, an adult, who has suffered from severe asthma for two years since the removal of nasal polypi, previous to which she had no attacks. All the usual remedies have been used unavailingly. Vaccine treatment in an institution was unsuccessful; she was also put through the usual skin tests, and a régime instituted accordingly. Adrenaline gives great relief during paroxysms, but they recur nightly. Any suggestions would be welcomed.

INCOME TAX.

Motor Car Transactions.

"J. W. M.," "J. M. L.," and "H. W. F."—The principle underlying the question of motor car renewals is this—that the expense of replacing a car with one of similar grade, power, accommodation, etc., is a legitimate expense, but to the extent to which the expenditure provides an improvement in car equipment the expense is not legitimate. A corollary, which was officially recognized by official evidence given before the Royal Commission on Income Tax, is that if the above condition is complied with the expense is allowable even though it involves a greater outlay than the original car.

"H. W. F.," £400 − £110 = £290, assuming the car to be similar.
"J. M. L.," £195 − £75 = £420, on the same assumption.
"J. W. M.," £560 − £180 = £380.

LETTERS, NOTES, ETC.

EPIDEMIC STOMATITIS.

DR. W. A. TRUMPER (Ivybridge) writes that the cases referred to by "Cloybank" (p. 537) reminds him of two children at a mill-house in the Kennet valley over twenty years ago who had similar signs and symptoms. "An inquiry as to the drains caused the parents to pour some carbolic acid down those channels. The following day their tea tasted of carbolic, and the diagnosis was a polluted well. Possibly 'Cloybank's' cases may have a similar cause."

THE GENERAL PRACTITIONER AND REFRACTIONS.

DR. CHARLES J. HILL AITKEN (Kilnhurst, nr. Rotherham) writes with reference to Dr. Larking's letter (p. 534): If a medical man is competent to do refractions let him have the necessary plant for the work visible in his surgery and the natural curiosity of his patients will soon let it be "known" that he is prepared to examine for and prescribe spectacles. After a few successful cases a "suitable title" on his plate will be quite unnecessary.

THE CARE OF THE TEETH.

DR. A. D. JILLA, L.M.S.Bombay (Manchester), in the course of a letter on this subject, writes: From personal experience and daily contact in practice I find that men and women are not inclined to devote even one-tenth of the time to their mouth and feet that they give to their face, hands, and hair. It is important to use the toothbrush the first thing in the morning, but perhaps the toothbrush itself may be the stumbling-block. It is not easy to design a toothbrush that would conveniently make its way between the teeth and the cheek up to the very last molar. Some toothbrushes are too hard. They make the gums bleed and are prejudicial to the safety of the enamel of the teeth if roughly used. Some are too soft, or get so by use. Moreover, the cost of the toothbrush is, in an average family of working and middle classes, an ever-recurring item. In countries the teeth of whose inhabitants are a source of envy to Western nations it is hardly the toothbrush that is responsible for the elegant condition of the teeth; it is mainly the general desire and instinct—scrupulous as well as religious—of oral hygiene. In India the Hindus of certain districts use slender twigs of the babul tree every morning with which to brush their teeth. They chew it first and make the ends brushlike. A fresh one is used every day by each individual of the family and thrown away afterwards. But the rest of the people use their index fingers with a little tooth-powder—ordinary ashes or fine charcoal-powder. Custom, as well as religious injunction, forbids every Indian to taste any food or drink in the morning without this necessary mouth toilet and the morning prayers subsequent to the toilet and ablution. In my opinion the teeth of Western people stand poor chances of real improvement and trim condition as long as they stick to the idea of the tooth brush. Nature has supplied us with a very pliant elastic tooth brush in the shape of the first or index finger. It can not only work its way to the farthermost molar tooth, but it also feels its way, using less force when any of the gums happen to be in an inflamed condition, or any of the teeth loose or painful. The finger can be used horizontally or vertically, as some dentists recommend for the toothbrush, and the nail is also handy to reach the clefts and interspaces between the teeth.

Education on oral hygiene to school children is indeed a good recommendation, but unless the parents co-operate, and the teachers inform them regularly immediately they notice anything wrong about the condition of the urchins' teeth, I am afraid no satisfactory result could be obtained. But perhaps the guilt should be laid at the door of the teachers and the parents themselves in the first instance. These should therefore be initially approached by suitable propaganda, and, above all, let them begin with the index finger themselves in the start.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 29, 32, 33, and 34 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 30 and 31.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *124*.

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